

# Master Plan

## Port and Harbor Demand and Feasibility Project

Prepared for the  
**Kenai Peninsula Borough**  
April 1980

**Woodward-Clyde Consultants  
and  
Soros Associates**

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and  
Soros Associates**

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Chairman, Public Works Committee

Mr. Edward Ambarian: Port and Harbor Committee member

Mr. Keith C. Campbell: Port and Harbor Committee member

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Mr. Donald E. Gilman: Mayor, Kenai Peninsula Borough

Mr. Ike D. Waits: Principal Planner and Project Manager

Mr. Frank L. McIlhargy: Director, Economic Development Office

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and Jack Knecht: Francisco

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and James Bently: Planning, Juneau

Mr. Clyde Courtnage U.S. Economic Development Administration,  
and Cindy Meinke: Anchorage

## PREFACE

This Master Plan presents detailed findings for the Kenai Peninsula Borough, Port and Harbor Demand and Feasibility Project. These findings include development potentials, energy facility siting requirements, Borough-wide goals, alternative growth strategies, feasibility analyses, and the Borough role in port development.

The project involved several stages of analysis by the consultant and of review and direction by the Borough. The process is comprised of: (1) an analysis of development potentials, including potential energy facility sites; (2) an identification of alternative growth strategies, using Borough and community goals as a guide; (3) selection by the Borough of the most desirable strategy; and (4) preparation by the consultant of a series reports for port and harbor improvements related to the selected strategy.

The reports\* produced for this project include:

1. The Summary, April 1980
2. An Action Plan, April 1980
3. The Master Plan, April 1980, and
4. A Statistical Appendix, April 1980

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\*Kenai Peninsula Borough, Port and Harbor Demand and Feasibility Project, prepared for the Kenai Peninsula Borough by Woodward-Clyde Consultants and SOROS Associates.

## TABLE OF CONTENTS

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	<u>Page</u>
ACKNOWLEDGEMENT	i
PREFACE	ii
LIST OF TABLES	v
LIST OF FIGURES	vii
I INTRODUCTION	1-1
Objectives of the Project	1-1
Scope	1-1
Background for the Project	1-2
A Perspective for the Project	1-4
Approach to the Project	1-6
II DEMANDS	2-1
General	2-1
Fisheries	2-4
Recreation/Tourism	2-23
Energy and Mineral Developments	2-40
Other Developments	2-60
Summary for the Demand Analyses	2-69
III SHIPPING AND TRAFFIC PROJECTION	3-1
Introduction	3-1
Present Shipping Services	3-3
Current Traffic Patterns	3-5
Projected Traffic Patterns	3-14

## TABLE OF CONTENTS (Continued)

---

	<u>Page</u>
IV SITE AND FACILITY REQUIREMENTS	4-1
Homer	4-2
Kasilof	4-7
Kenai/Nikiski Area	4-8
Ninilchik	4-14
Port Graham	4-16
Seldovia	4-17
Seward	4-19
Cape Starichkof	4-24
Tyonek/Beluga Coal Area	4-26
Summary of Port Improvement Costs	4-27
Summary of Port Development Considerations	4-30
Other Transport Requirements/Options	4-33
V FEASIBILITY AND BENEFIT ANALYSES	5-1
Costs	5-1
Benefits	5-2
Feasibility Analysis	5-7
Summary	5-8
APPENDIX A: HISTORIC GOALS AND DEVELOPMENT STRATEGIES	A-1
Historic Goals	A-1
Strategy Designs	A-6
Strategy Comparisons	A-15
APPENDIX B: TOURISM DEVELOPMENT STRATEGY	B-1

# LIST OF TABLES

		<u>Page</u>
Table II-1	PROJECTED COOK INLET SALMON HARVESTS	2-6
Table II-2	SALMON FREEZING CAPACITY	2-10
Table II-3	COMPARATIVE PROCESSING COSTS	2-14
Table II-4	COMMERCIAL FISHING BOATS: 1978-1990	2-18
Table II-5	JAPAN: COAL DEMAND, INDIGENOUS SUPPLY AND IMPORTS: 1976-2000	2-44
Table II-6	JAPAN: STEAM COAL DEMAND AND SUPPLY BY SOURCE: 1977-2000	2-46
Table III-1	TRAFFIC VOLUMES SOUTHCENTRAL ALASKA PORTS, 1977	3-6
Table III-2	ALASKA RAILROAD INTRASTATE TRAFFIC, 1977	3-8
Table III-3	ALASKA RAILROAD INTERSTATE TRAFFIC BY GATEWAY 1977	3-9
Table III-4	MOTOR FREIGHT TRAFFIC PATTERNS, 1977 SAMPLES	3-11
Table III-5	CARGO PROJECTIONS: SUSTAINED ECONOMIC DEVELOPMENT STRATEGY	3-16
Table IV-1	ASSIGNMENT OF PORT IMPROVEMENT COSTS	4-28
Table IV-2	FACILITY DEVELOPMENT CONSIDERATIONS	4-32
Table V-1	CAPITAL IMPROVEMENT PROGRAM	5-3
Table V-2	ECONOMIC BENEFITS IN 1991	5-4

LIST OF TABLES (Continued)

		<u>Page</u>
Table V-3	COST-BENEFIT SCHEDULE: SUSTAINED DEVELOPMENT STRATEGY	5-6
Table V-4	SUMMARY OF SITE CONSIDERATIONS	5-9
Table A-1	BUSINESS-AS-USUAL STRATEGY	A-9
Table A-2	SUSTAINED ECONOMIC DEVELOPMENT STRATEGY	A-12
Table A-3	ACCELERATED GROWTH STRATEGY	A-14
Table A-4	STRATEGY COMPARISONS	A-16



## LIST OF FIGURES

---

	<u>Page</u>
Figure 1      KENAI PENINSULA BOROUGH - STUDY REGION	1-3
Figure 2      OIL PRODUCTION PROFILE OF COOK INLET: 1960-1995	2-52
Figure 3      GAS PRODUCTION PROFILE OF COOK INLET: 1960-1995	2-55

*We too often find ourselves preoccupied with attempting to divine what will be our state ten, twenty-five, even fifty years hence. But what we often fail to realize is that every decision made, every voice heard and not heard, and every success and failure drastically affect that future. Instead of speculating on what the world might be like in the year 2000, we would do well to consider what mechanisms, what people, and what decisions must be attended to today in order to shape all the years to come.*

--Leonard J. Duhl, Daedalus

## I

### INTRODUCTION

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#### OBJECTIVES OF THE PROJECT

The object of the overall project was to prepare a short-range Action Plan and a long-range Master Plan for port and harbor developments in the Kenai Peninsula Borough. A key project task was to determine the role of the Borough in port and harbor developments and in energy facility siting decisions. Thus, Outer Continental Shelf (OCS) oil and gas development and domestic/international energy demands are incorporated as an integral part in the analyses and recommended harbor developments for the Borough.

#### SCOPE

The overall project consisted of the following tasks:

- Task I      Port and Harbor Demand Analyses
- Task II     Shipping and Traffic Projections
- Task III    Site and Facility Requirements

- Task IV     Economic and Financial Feasibility Analyses
- Task V      Goals, Plan and Benefit Assessments
- Task VI     Organizational and Administrative Requirements.

Tasks I, II, III, IV, and V are presented in this report. Task VI, organizational needs, is presented in the Action Plan. In addition, the project was organized to include guidance from persons interested in or affected by the program. Therefore, public workshops were held over the term of the project to collect information on goals, strategies for development and comments on the project.

#### BACKGROUND FOR THE PROJECT

The Kenai Peninsula Borough has experienced recent, strong periods of growth due primarily to the exploration and development of oil and gas resources. That development (taking place with little planning or government/private sector coordination) resulted in expanded economic activities, larger government revenues and general improvements in the quality of life throughout the Borough. It also resulted in mostly private port developments, such as the Nikishka Bay dock, Rig Tenders dock, the oil and gas piers at Nikiski, the woodchip pier at Tyonek, and numerous fishing docks around the Peninsula (see Figure 1). Most of these docks are single-purpose facilities, and their use for general cargo or other purposes is not possible. Thus, the Borough may not have captured all the benefits of that growth.

Once again the Borough is facing a period of potential growth. Large-scale developments that have growth potentials include:

- Lower Cook Inlet oil and gas possibilities
- The Pacific Alaska LNG plant

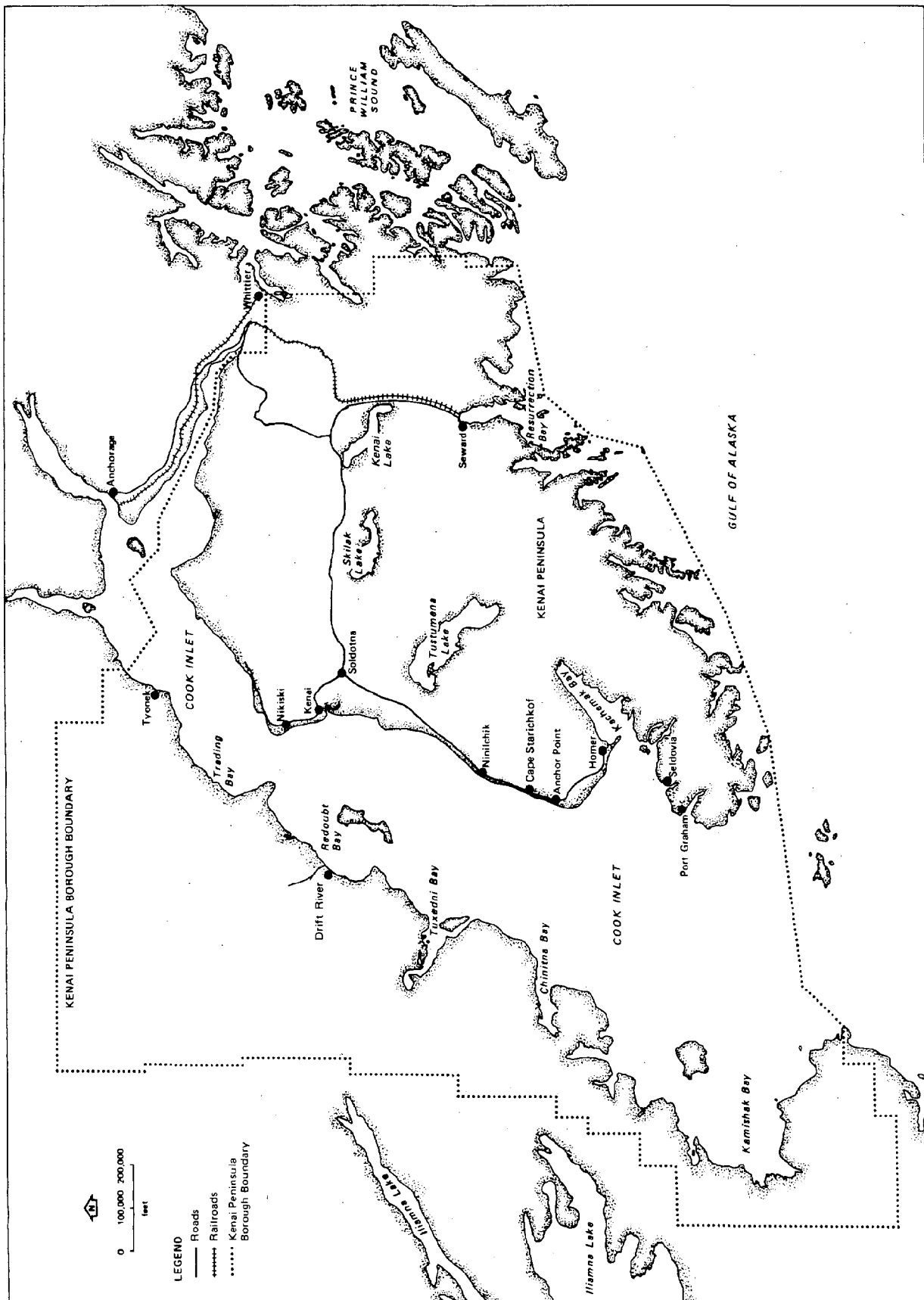


Figure 1. KENAI PENINSULA BOROUGH STUDY REGION

- Beluga coal mining and a possible methanol conversion plant
- Expanded high-value fish processing
- A bottomfish harvesting and processing industry
- The Bradley Lake dam
- A petrochemical facility based on gas liquids
- Recreational boating, and
- Growth outside the Borough that could affect Borough ports, i.e., the Beaufort Sea and Kuparuk developments, the Susitna dam, the Northwest Gas Pipeline, etc.

This possibility of widespread growth is accompanied by the opportunity to support activities that coincide with longer-term growth goals and to maximize benefits to the Borough. In this regard, successful growth cannot be accomplished merely by improving one mode (such as ports and harbors); nor can it be accomplished by improving the all-mode transport system alone. To be most beneficial to the Borough, port and harbor developments must be related to improvements in the larger economic and social development of the Borough.

#### A PERSPECTIVE FOR THE PROJECT

A necessary perspective on this project can be gained by reviewing: 1) the historical growth of the population, 2) the geographic context of the Kenai Peninsula Borough, and 3) the through-put and size of the ports around the Borough.

First, the Kenai Peninsula Borough (KPB) population--at about 25,000 in 1979\*--represents about five percent of the statewide population and 10 percent of the population in the Southcentral region, which

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\*Situation and Prospects, Kenai Peninsula Borough Economic Development Office and Planning Department, January 1980.

includes the KPB, Kodiak, Matanuska-Susitna and Anchorage Boroughs and extends as far east as Cordova and McCarthy. Starting with about 9000 in 1960, the KPB population experienced two strong growth periods in the late 60's and mid-70's due, respectively, to the Upper Cook Inlet oil and gas and to the Prudhoe Bay/Trans-Alaska Oil Pipeline developments.

The cities of the Borough had the following populations in 1979:

Kenai	@	4,400
Soldotna	@	2,400
Homer	@	2,200
Seward	@	1,800
Seldovia	@	500.

Of importance to this project is the absolute size of the KPB population and its distribution over the 25,000 square miles of the KPB.

Geographically, the KPB covers about 25,600 square miles of which about 15,700 square miles is land and 9900 square miles is water. It has a hinterland to the north via the Seward-Anchorage-Fairbanks rail and highway links, and a possible, but completely undeveloped hinterland to the west toward Bristol Bay and Bethel. Regarding the Alaskan interior, both Anchorage and Valdez are competing strongly for service to that region. To the west, natural barriers and the very lightly populated hinterland indicate that KPB port services to those areas will be highly dependent on a very strong growth in the southwest and western regions of Alaska. Thus, KPB ports will: 1) have to continue to compete with Anchorage, Whittier, and Valdez for the hinterland to the north, 2) await major developments before serving a hinterland to the west, and 3) depend heavily on developments inside the KPB for the generation of port service demands.

Regarding port tonnages in 1977, the inbound and outbound volume of 90,000 tons for Seward was the largest for any non-petroleum KPB port. In fact, ignoring the specialized petroleum ports of the KPB, this 90,000 tons was well over half the 170,000 tons of general cargo handled by all non-petroleum KPB ports. Even so, Seward's total volume was less than half that handled by Kodiak, only about one-seventh that handled by Whittier, and less than three percent of that at Anchorage during the same year. Thus, statistically, KPB ports are not a major factor in waterborne shipments in and out of the Southcentral region. With a current maximum estimated through-put capacity of 800,000 tons per year at Seward and less than 200,000 tons per year at Homer and Nikiski, KPB ports are at very early stages of development--a development that reflects the KPB's current population base and the current lack of a large hinterland.

#### APPROACH TO THE PROJECT

The approach to this project was to take maximum advantage of the KPB resources and competitive position. It recognizes the links between economic development potentials--local goals--infrastructural support requirements--financing--and organizational requirements. These links can act as key determinants for port developments and include community attitudes toward growth (hence the concern with growth goals); competing port developments (hence the concern with the ports of Anchorage, Whittier, Kodiak, etc.); and the links between ports and the rest of the economy. In effect, this project, while focusing on the preparation of a Master Plan and Action Plan for port and harbor developments, deals with the larger socioeconomic system in which the port developments will take place.

Another important aspect of the approach was the organization of alternative strategies for development. The objective of this effort was to combine development opportunities and growth goals into a strategy for economic and port improvements that would receive the broadest possible public support. Without this broad support, port and harbor improvements in the Borough are likely to proceed as they have in the past. However, with a general consensus on goals for economic/social development, it may be possible to coordinate port planning and financing so as to maximize benefits (jobs, wages, profits) to all Borough residents by providing the Borough with the tools to compete effectively for tourism, bottomfish, petrochemical, and other development potentials.

There are several reasons for analyzing alternative strategies for development. For example, development goals are not easily discussed in the abstract; they change over time and often relate only indirectly to specific projects. But, if the implications of having chosen a particular set of goals (and a related development strategy) are understood, it is much easier for governments to gain a consensus on needed actions and to successfully develop zoning plans, determine port priorities or issue bonds to support specific projects. In this regard, historic goals, although of limited usefulness, do provide a perspective on feasible strategies for development (see Appendix A for historical goals). In addition, there is a technical requirement, when considering alternatives, to evaluate each against a common base. That is, each potential action alternative must be evaluated against the alternative of doing nothing at all.

Thus, the approach used in this project was to:

- review earlier goals
- combine development options and historic goals into preliminary strategies for development



- evaluate and present alternative strategies to as many Borough residents as possible to help focus on current goals, develop a consensus, and select a desirable strategy
- revise the selected strategy to more closely reflect current goals, and
- prepare final feasibility analyses and action plans based on the selected development strategy.

Current Goal Preferences. Following an identification of historic goals from KPB documents, presentations were made at a series of public workshops\* to obtain feedback on preliminary development options and goals. These presentations resulted in the following summary goals.

The goals of obtaining funds for harbor improvements and increasing the use of under-utilized ports and related infrastructures were unanimously held. Strong desires by local citizens and government to improve business climates and promote local advantages were also evident. Opinions generally supported increased employment opportunities through stable growth or attracting industry that would provide a strong employment to the communities. The establishment of ship repair services and bottom-fish industries were specifically mentioned in Seldovia, Seward, Kenai, and Homer. Each of these communities expressed the goal of attracting port traffic from Anchorage by serving as a satellite port.

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\*Including the Borough Assembly, Planning Commission, Economic Development Council, and city councils, Chambers of Commerce, and general public meetings throughout the Borough.

Decreased Borough freight costs were mentioned as a correlary goal to increased port use. Homer and Kenai were actively interested in encouraging the development of nonrenewable resources and industrial projects that would result in the need for multiple-use port facilities. Also, growth conflicts were strongly apparent in some communities (recreation vs. commercial fishing in Ninilchik) and less apparent in others (OCS exploration support vs. commercial fishing in Homer).

The government's role in port and harbor development came up in every community. Federal and state government agencies were viewed by municipal governments as potential funding sources for port and harbor facilities. However, some federal agencies were viewed both as a hindrance to local harbor planning, and as providing inequitable support to competing regional ports.

Borough goals included providing planning assistance to local communities while allowing as much local autonomy as possible. In addition, the Borough was concerned about identifying port development options that maximize benefits to the Borough as a whole. Local community opinions regarding the role of Borough government ranged from the desire for valuable planning assistance to the feeling of neglect or undue interference in local plans. Local autonomy over port development was an important goal to most communities, and several communities were concerned about the ability of the Borough to provide local assistance without showing favoritism to some communities or interfering with others.

#### The Design of Development Alternatives

As with most groups and individuals, such as those throughout the Kenai Peninsula Borough, compatible and conflicting goals existed that could be grouped into alternative growth strategies. For example, the current goals referenced above (plus related historical goals presented in Appendix A) revolved about:

1. moderate to very strong economic growth goals
2. the desire to tap federal and state funding sources whenever possible
3. organizational concerns about local autonomy versus the Borough's involvement in planning and funding improvements in the cities, and
4. social goals about improving job opportunities, minimizing government, and improving the quality-of-life for Borough residents.

The strategies, which evolved from combining compatible goals, are summarized as follows. A more detailed description and evaluation of each is provided in Appendix A.

Business-as-Usual. This strategy is one under which current practices would be continued--no Borough planning actions, financing or support would be provided to current or new economic developments or to related port improvements. City and private sector port improvements would take place on an as-needed and as-possible basis. The Borough would not plan for, promote, or finance economic or transportation projects, and employment and population growth in the Borough would probably fall between one and three percent per year over the 20-year study period. This strategy is consistent with the minimal growth, minimum government, no tax goals. No change in Borough activities or organization would be required and this option would represent the doing nothing "base" against which all "action" or growth strategies could be compared.

Sustained Economic Development. The focus for this strategy was a long-range stimulus to the economy based primarily on supporting renewable resources (fish, timber, recreation/tourism) rather than extractive oil, gas, coal, or other mineral developments. Moderate economic growth, Borough involvement only in the provision of port services, and the acquisition of state and federal funds are central goals that this strategy addresses. Extraction activities would be encouraged and accommodated to the extent that they did not preclude the development of renewable resources. The emphasis would be on private sector initiations of economic developments with the Borough providing related port and harbor improvements. Cooperative Borough-private sector planning and implementation would be imperative. A first-step port organization would also be required.

Under this strategy, long-range job creation and population growth rates would probably range between 2.5 and 3.5 percent per year over the 1980-2005 period.

Accelerated Economic Growth. This alternative differs from the Sustained Development Strategy, not because of different economic goals, but in the roles that the Borough and cities would play in promoting development. It would meet strong growth goals, goals for a Borough stimulus to economic growth and significant improvements in the quality-of-life on the peninsula. Under this strategy, the Borough and cities would act cooperatively with the private sector to initiate, finance, and promote oil, gas, coal, tourism, and bottomfish developments. Promotional activities would include marketing port services, international tourism, resource marketing efforts, etc. With a maximum, timely, cooperative support to private sector activities by the Borough and cities, employment and population growth rates might reach five to six percent per year over the next 20 years. However, new resource discoveries and new project locations in the Borough (LNG, gas liquids, methanol, and power plants) would all be necessary to make these growth rates possible.

These strategies were organized, described, and assessed on a preliminary basis (see Appendix A) and the results presented in meetings throughout the Borough. Primary considerations were organizational requirements, functional activities, economic feasibility, benefits in terms of jobs, wages and profits accruing to the Borough, and qualitative assessments of the risks involved with each strategy.

Following the review of these options and requirements for development, the Borough Assembly selected the "Sustained Development Strategy" and directed Woodward-Clyde Consultants to proceed, anticipating a Borough assumption of port powers outside the cities (see Kenai Peninsula Borough Resolution 79-142, Oct. 9, 1979). Thus, the following sections of the Master Plan focus on the Sustained Development Strategy and analyses for that strategy.

## II DEMANDS

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### GENERAL

Demand projections for port and harbor facilities are basic to the transportation and feasibility analyses presented below. These port demands are analyzed in relationship to economic development potentials and possible transportation cost reductions. To an extent, these demands will be affected by the support or lack of support that the Borough provides its goals for development. Thus, the following sector-by-sector analyses represent an integral step in projecting port demands that are consistent with Borough goals for development.

The generation of demands consists of two sets of analyses:

- A general demand projection is based on growth trends for current traffic through Borough ports. Essentially, this analysis identifies the demand arising from growth in current economic activities over the study period, but not that related to major new economic activities.
- Second, port demand projections are based on analyses of new activities in each economic sector (coal, bottomfish, etc.). These analyses identify major new long-term developments and related port requirements not covered by the general trend analysis.

Thus, total port and harbor demands consist of projections based on normal population and traffic increases and on traffic resulting from major new developments expected under the Sustained Development Strategy.

Several precautions must be observed regarding the following analyses and projections. Among the more important are data inadequacies, differences between annual or short-term fluctuations versus long-term trends, state-of-the-art limitations, and the consequences of major new market or government policy changes which are exceptionally difficult to predict. Examples of these precautions affecting this report include the following:

- Detailed data on goods and passenger movements on the state ferry system are inadequate for port analysis and planning purposes. Similarly, while detailed for some ports, the Corps of Engineers' data are not complete and do not include information on smaller harbors such as those at Seldovia or Port Graham.
- Over the short term, prices for products such as fish or timber can fluctuate widely as a reflection of international market adjustments or inflationary periods. Of concern to the projections herein are the longer-term trends which would affect port facilities with economic lives of 20 years or more.
- State-of-the-art limitations include the fact that "maximum sustained yield" (for renewable resources such as timber and fish) or "reserves" (for exhaustible resources such as oil, gas, and coal) are only concepts--not well-defined measures. Further, "participation rates" by recreationalists fall into the category of data to be used with caution.

- New market or government policy changes which are very difficult to assess in terms of their long-term impacts include:  
1) oil/gas price regulation, 2) technological changes such as synfuel developments or fish freezing technologies, 3) the term of inflationary periods, or 4) new product or service developments such as bottomfish harvesting, and processing.

Various approaches are available to the decision makers when confronted with significant capital investment decisions and inadequate or incomplete data. They may:

- Set out to remedy data voids or inadequacies
- Incorporate carefully designed monitoring procedures (to track the effects of changes) into continuing planning efforts, and/or
- Make capital investment decisions based on firm data in such a way as to be able to accommodate longer-term, less certain needs.

Whatever approach is chosen, it is important to incorporate these factors into any decisions regarding port or harbor developments in the Kenai Peninsula Borough (KPB).



## FISHERIES

### Introduction

During the past two years, there have been a number of published reports covering the potential for expansion of the fishery resources of Alaska using U.S. fishing vessels and domestic processing facilities. Most of these studies focus on the impact of the Fisheries Conservation Management Act (FCMA), which extends the offshore U.S. fisheries jurisdiction from 12 to 200 miles. The FCMA specifies that bottomfish\* resources be managed by regional councils to provide optimum yields, and there has been much speculation and interest in the expansion of the domestic harvesting and processing of these fish. In addition, a Bottomfish Task Force, formed by Alaska's Governor Hammond in 1978, set certain goals for development of this fishery (23)\*\*. The objectives include: (a) development and domestic utilization of bottomfish to the fullest optimum yield over the next twenty years, (b) establishment of permanent on-shore processing facilities with adequate port/harbor infrastructures, and (c) encouragement of maximum participation of Alaskan workers and entrepreneurs in the bottomfish industry.

In recent years, the high value species of Alaska's domestic catch, such as salmon, halibut, shrimp, king and tanner crab, have been nearly 100 percent utilized. However, with the foreign fleets now barred from participation in these inshore fisheries, catches of salmon and halibut available to U.S. fishermen may increase substantially in coming years. In addition, the growing market for frozen, rather than canned salmon will have a bearing on the need for handling and shore processing facilities.

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\*Also referred to as "groundfish" or "underutilized species."

\*\*The numbers in parenthesis refer to a listing in the bibliography presented at the end of this section, a practice to be followed throughout this report.

In this report, the objective is to show the possibilities for development, the requirements for that development, and the relationship of that development to the KPB port and harbor needs. This will be accomplished by systematically discussing the key subjects of resource availability, harvesting capacities, processing requirements, and cost and markets for the various species or products.

#### Resource Availability

Salmon. The catch of salmon in Alaska during 1977 by the U.S. fleet was 128,000 metric tons; this was the maximum sustainable yield\* and represents 100 percent utilization, as it has for many years (7). This was a 13 percent increase over the catch for 1976. Complete statistics are not yet available for 1978\*\*, but indications are that the movement of foreign mothership operations out of the area will result in a beneficial increase for Alaska's overall salmon resource. In addition, the program for improving salmon spawning areas and expanding hatchery facilities will assist in the buildup of the salmon fishery in future years.

Historically, the salmon resource has fluctuated from year to year both as to species and districts--often for reasons that cannot be explained. Even so, it is reasonable to project a conservative estimate of a 10 percent catch increase every five years in the Cook Inlet area, based on expected long-term increases in the catch due to FMCA and fishery enhancement practices. Projections for the next 10 years are shown in Table II-1.

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\*Maximum sustainable yield is not a precisely described volume, so year-to-year statistics are not particularly significant.

\*\*Early indications are that the 1978 catch will exceed 210,000 tons, an increase of more than 50 percent over the 1977 catch (17).

Table II-1. PROJECTED COOK INLET SALMON HARVESTS  
(Number of Fish Caught)

<u>Year</u>	<u>Kings</u>	<u>Reds</u>	<u>Cohos</u>	<u>Pinks</u>	<u>Chums</u>	<u>Total</u>
1970	8,054	750,111	276,770	1,352,389	999,005	3,386,329*
1975	4,933	712,960	233,583	1,399,791	973,442	3,324,709*
1980	5,500	785,000	257,000	1,500,000	1,100,000	3,650,000
1985	6,000	865,000	283,000	1,650,000	1,200,000	4,000,000
1990	6,600	950,000	310,000	1,800,000	1,300,000	4,400,000

\*Actual Catch - Source: State of Alaska Department of Fish and Game.

Halibut. The U.S. and Canadian fleets have divided their waters into zones and strictly controlled halibut fishing for over 50 years, but it has been necessary to drastically reduce the quotas in recent years due to fishing by foreign vessels off the Alaskan coast. It is anticipated that the catch by U.S. and Canadian fishermen can be doubled in the next 10 years, since foreign fleets are no longer permitted to catch halibut within the 200-mile zone. If so, it can be assumed that the halibut landed between Seward and Homer could also be doubled to eight million pounds. A favorable indication is that the catches by U.S. and Canadian fleets in the regulatory areas which were restricted to 13.8 million pounds in 1978 have been increased to 20.8 million pounds for 1979 (25). To date, the modern freezing and processing plant at Seward has been handling in excess of four million pounds of halibut annually (18), including any catch landed at Homer and trucked to Seward.

King Crab. The maximum sustainable yield in Alaska for king crab during 1978 was 61,000 tons, which represents 100 percent utilization by the U.S. fleet. This catch has remained relatively constant in recent

years and is divided into quotas for various areas. A relatively small quantity of approximately three million pounds is taken in Cook Inlet.

Tanner Crab. The catch of tanner crab in Alaska during 1977 was 57,000 tons, with 50,000 tons caught by the U.S. fleet and 7000 tons by foreign vessels. Of this catch, only about 2000 tons is taken in the Cook Inlet area, and no significant increase in the quota is expected in future years.

Shrimp. Like crab, the shrimp resource is variable and fully utilized. In 1978, the Cook Inlet catch of 6.5 million pounds was less than 10 percent of the total Alaskan catch of 172 million pounds. (These figures dropped in 1979 to four million and 50 million respectively.) With little prospect of significant growth in this resource and because of its small size, shrimp harvests are unlikely to affect future Borough port or harbor developments.

Bottomfish. Alaska's Continental Shelf to 200 fathoms covers an area of 477,000 square miles with a bottomfish resource conservatively estimated at 1,800,000 metric tons (3). Within a 200-mile radius of the city of Homer there are 40,000 square miles of Continental Shelf where 245,000 metric tons of bottomfish were caught and processed by foreign fleets in 1976 (15). Accordingly, and as reported by the Combs Development Task Force (10), a tremendous resource exists off the Kenai Peninsula shores.

Summary of Resources Availability. Fish resource availability of particular interest to this project involves three important aspects:

(a) Amongst the high value species, the king crab, tanner crab, and shrimp are presently being fully utilized at maximum sustainable yields with no major increases in quotas anticipated in the near future.

No changes are expected in the processing and handling of these species so they will not affect the port developments discussed below.

(b) It is anticipated that the catch of salmon will be increased by 20 percent in the next 10 years and that the quotas of halibut for U.S. and Canadian fishermen will be doubled by 1990 (25).

(c) Because of very large foreign catches of bottomfish off the Borough coast prior to the FMCA, Borough fishermen have an excellent opportunity to participate in the development of this resource to as much as 20,000 tons of processed fish by 1990.\* With no public sector support, these tonnages would be 5000 tons and with a medium level of support, the volume could be as high as 10,000 tons.

#### Harvesting Capability

The U.S. fishing fleet is considered adequate to catch the maximum sustainable yield of the high-value species of fish and shellfish. However, the U.S. fishing fleet is presently limited to a few bottom trawlers that are rigged to harvest bottomfish. Furthermore, most fishermen and vessel owners are not interested in engaging in bottomfishing due to the low landed prices for these fish and the high cost of converting their fishing boats.

In recent years, salmon and king crab fishing have been very lucrative with landed prices of up to \$1.50 per pound for these species.\*\* Even for tanner crab, landed prices have exceeded \$0.50 per pound and for halibut up to \$1.80 per pound. It has not been unusual for the

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\*Assuming a strong State and Borough support for this activity.

\*\*A severe drop in prices (to about \$0.95 per pound for salmon) was experienced in 1979 with unpredictable long-term effects.

captain of an Alaskan crab vessel to make over \$150,000 and the crew members over \$60,000 apiece for a four-month season. In comparison, with landed prices of groundfish at approximately \$0.15 per pound, the fishermen might not earn more than \$20,000 a year, even with year-round operations, and recent prices have been \$0.07 to \$0.10.

The investment for constructing and rigging each suitable vessel for bottom trawling could exceed two million dollars and may not be justified at present bottomfish prices. Also, while it is possible to convert some crab vessels at considerable expense--up to \$500,000--for bottomfishing, it is generally considered unprofitable to do so.

A small number of bottomfish trawlers are currently being built in shipyards on the Pacific Coast. However, at the present time these boatbuilders have a two-year backlog of orders for crabfishing vessels. This backlog is not due to a shortage of boats for this fishery but to the desire of crab fishermen to reinvest recent high earnings and take advantage of subsidy and tax incentives.\*

#### Processing Capacity

Salmon. The processing capacity is considered adequate for canning the salmon landed at the various plants in Kenai, Homer, and Seward on the Kenai Peninsula. Freezing and cold storage facilities were expanded dramatically during 1979, particularly on the Kenai River. Also, a major increase in the freezing capacity at the Seward Fisheries plant will be completed at Homer for the 1980 season. The freezing capacities at Anchorage and on the Kenai Peninsula are given in Table II-2.

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\*Under a long-established federal law, U.S. owners are compensated for the high costs of domestic boat construction in the U.S. (versus costs for foreign-built boats) through a government subsidy program.

TABLE II-2. SALMON FREEZING CAPACITY - 24-HOUR DAY

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Anchorage	- Whitney Fidalgo Seafoods	- 200,000 lbs/day
Anchorage	Seafood Processing Co.	- 150,000 lbs/day
Kenai Area	- Columbia-Wards Fisheries	- 200,000 lbs/day
	- Kenai Fisheries Co.	- 225,000 lbs/day
	- Dragnet Fisheries Co.	- 225,000 lbs/day
	- Sea Catch, Inc.	- 100,000 lbs/day
	- Salamatof Seafoods	- 100,000 lbs/day
Seward	- Seward Fisheries, Inc.	- 200,000 lbs/day
Homer	- Seward Fisheries, Inc.	- 225,000 lbs/day
	- Whitney Fidalgo Seafoods	- 100,000 lbs/day

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The increased freezing capacity is due to a major change in the industry whereby part of the salmon catch, which traditionally has always been canned, is now being frozen. Another major development has been the shipment of fresh salmon by air from Bristol Bay and other areas to Anchorage, Kenai, and Homer, where the fish are headed and eviscerated and the salmon eggs saved for Japan. The salmon are then frozen and loaded into reefer containers and hauled to the container terminal at Anchorage for shipment to Seattle.

This new development in salmon processing is due to the market for salmon in Japan, the increased demand in the U.S. for salmon steaks, and resistance by consumers to high-priced canned salmon. It is anticipated that 140 million pounds of Alaskan salmon will be frozen during 1979: about 10 to 12 million pounds will be frozen on the Kenai Peninsula (25).

Halibut. At Seward, the modern freezing and processing plant of Seward Fisheries, with a capacity of about 200,000 pounds per day has been

handling in excess of four million pounds of halibut annually (18). The freezing and cold storage facilities expansion, by the Seward Fisheries plant at Homer, will also have a capacity of about 225,000 pounds per day in 1980.

With the anticipated increase in the resource and allocated catch, it is expected that annual halibut landings at Homer and Seward will be doubled to at least eight million pounds in the next 5 to 10 years. Presumably, the landings will be made in proportion to processing capacities at Seward and Homer (i.e., about half and half), but seasonal differences could result in trucking transfers between the two cities.

Sablefish. Sablefish (usually called Black Cod) are traditionally caught with baited longlines, as are halibut. In recent years, foreign fleets have taken substantial quantities of sablefish from Alaskan waters, limiting catches by U.S. fishermen. However, a device called the Mustad Autoline has been used successfully in European waters and is to be tested for fishing sablefish. If successful, it could rapidly expand the harvest of these fish by U.S. fishermen.

The future catch cannot be predicted at this time, but sablefish could develop into a sizeable domestic fish resource. They command a price of up to \$0.80 per pound with a ready but fluctuating market both in the U.S. and Japan. It is anticipated that the expansion of sablefishing could substantially increase fish landings at Homer and Seward, as well as other ports in southeast Alaska.

Crab species. Most crabs are frozen rather than canned or shipped fresh. In fact, the modern king crab processing plant of Pacific Pearl Seafoods at Seldovia has the capacity to handle 10,000 crabs daily and is freezing an average of six million pounds of king, tanner, and dungeness crab annually (18). Also, this is the only Borough plant processing



shrimp in quantities of significance to the port and harbor development discussed below.

Bottomfish. Two companies began shoreside processing of Alaskan bottomfish in 1977--New England Fish Company at Kodiak and Icicle Seafoods, Inc. at Petersburg. These companies entered into contracts with the Alaska Department of Commerce and Economic Development which granted each firm \$145,000 to be used in groundfish processing facilities (14). According to available sources, the only other processing facilities for Alaskan groundfish at the present time are at Alaska Packers in Kodiak, and they are seldom used.

An interim analysis of New England Fish Company's (NEFCO) operations in Kodiak details their bottomfish experiences for the period from April 1978 to January 1979 (19). This is a modern processing plant with the latest labor-saving machines for preparing frozen fillets and minced products from cod and pollock. Capital costs for processing machinery and facilities total \$1,175,138 for a maximum raw fish input of 20,000 pounds per eight-hour shift.\* Further data on the NEFCO groundfish operation are presented below under "Production Costs" and "Marketing."

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\*The 1978 bottomfish report offers an in-depth analysis and conclusions concerning the economic outlook for the development of a bottomfish industry in Alaska (11). This report provides details on the plant and equipment required to process 9000 pounds of pollock per hour with an initial investment of \$1,140,000. This is considered the minimum plant capacity required to efficiently handle an input of approximately 10,000 metric tons a year of pollock. However, in view of NEFCO's actual experience at Kodiak with far less production for the same investment, it is concluded that this 1978 analysis of groundfish processing could be highly optimistic.

The report on NEFCO's groundfish operation has pointed out a number of unexpected and unresolved problems. First, it was considered necessary to eviscerate cod on the trawlers to avoid enzymatic digestion and rapid deterioration of quality. This eviscerating by the fishermen has been resisted. Also, the harvested fish were smaller than expected, and the grading of fish for species and size either on the fishing vessel or ashore, requires a special expertise. Both of these aspects added to costs. In addition, about 20 percent of the groundfish were infested with parasites, which created unexpected processing costs. Heavily infested fish had to be discarded, thereby lowering yields, decreasing capacity and increasing the costs of production.

#### Production Costs

Production costs for the high-value Alaskan fish products do not interfere with their successful marketing, so the following discussion will only cover production costs for groundfish.

The first production factor which must be considered is the landed cost of raw fish at the plant. This could be a major stumbling block in attempting to utilize these fish. It is reported that the agreement between Russia and Japan for foreign offshore fleets was an on-board price for pollock of \$157.00 per metric ton (\$0.075 per pound) during 1978. This price was raised to \$220.00 per metric ton (\$0.10 per pound) for 1979 (NMFS March 1979), but fell again in 1980. As a result, it is estimated that frozen pollock fillets and blocks can be delivered by the Russians and Japanese to ports in the U.S. from foreign factory-ships at \$0.56 per pound, as shown in Table II-3. There is a margin of profit of \$0.14 per pound for frozen fillets being marketed at \$0.70 per pound.

Table II-3. COMPARATIVE PROCESSING COSTS

<u>Cost Item</u>	Russian & Japanese	Alaskan	
	Producers	Producers	
	(Cents/lb.)	(Cents/lb.)	(Cents/lb.)
Landed Cost of Raw Fish	10	15	20
Fillet Costs - 32% Yield	31	47	62
Processing Costs	15	15	15
Freezing & Packaging	5	5	5
Freight, Wharfage, etc.	<u>5</u>	<u>5</u>	<u>5</u>
Cost Delivered to Seattle	56	72	87

There is no assurance that pollock will be landed by U.S. fishing vessels at \$0.15 per pound, even though that price would be 50 percent higher than the current price agreed upon by foreign producers. However, assuming that pollock could be landed at Homer or Seward at \$0.15 per pound, Table II-3 shows that the cost delivered to Seattle would be approximately \$0.72 per pound for frozen fillets. This cost does not include overhead or profit, so assuming the quality to be equal, U.S.-produced fillets would not be competitive with foreign imports. Assuming a \$0.20 landed price (in order to motivate fishermen) the Alaskan products would be even less competitive at \$0.87 per pound delivered to Seattle.

A switch to factory-ship processing would not change the situation, since the cost of producing fillets and blocks from bottomfish on offshore facilities would be higher than for shoreside plants. The A.D. Little report (11) estimates an extra cost of \$2.25 per pound which would amount to an extra \$0.075 per pound for fillets, all other costs being equal.

The problems encountered by NEFCO in 1978 and 1979 and by Icicle in 1979 in processing groundfish might be solved by producing high quality fillets and blocks comparable to those being imported from the foreign fleets. However, to be price competitive, the landing of groundfish should not exceed \$0.07 to \$0.12 per pound--it is questionable if this can be accomplished at any time in the near future. This is true because the subsidy of \$0.03 per pound to NEFCO by the Department of Commerce and Economic Development was insufficient to avoid a substantial loss during the trial period. One suggestion has been that crab or salmon fishermen be coaxed to fish for groundfish at realistic prices during the off-season, and there are some indications that this could occur in the next few years.

#### Marketing

The following will be limited to the discussion of the underutilized fish since markets for the high-value fish are fairly well established and, therefore, represent known considerations.\*

The annual consumption of groundfish products in the U.S. is 325,000 metric tons, with over 90 percent being imported. Furthermore, bottomfish consumption in the U.S. has been growing even faster than total fish consumption and in 1977 represented 30 percent of the total (11). In 1976,

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\*Markets for high-value salmon and crab, while well established, experienced a not uncommon fluctuation in 1979, with prices on the principal Japanese market dropping significantly. As a result of this drop, a large, unsold carry-over exists at the outset of the 1980 fishing season, and several major efforts toward new market identification/development have been initiated. Such efforts are typically a time-consuming and arduous task for so large a commodity shift and many processors will probably consider a return to partial canning (as well as freezing) for the 1980 harvest.

it was reported that 40,000 tons of pollock fillets and blocks, the products of 125,000 tons of pollock, were caught in Alaskan waters by foreign fleets.

The price of the bottomfish fillets and blocks delivered to U.S. ports in top quality averages \$0.60 per pound, which is less than the production cost using landings from U.S. fishing vessels as discussed above. This situation might change in future years with increased prices of imported fillets or increasingly unfavorable dollar-yen exchange rates. However, it seems unlikely that by 1990, 90 percent of the Alaskan groundfish will be caught by U.S. vessels and only 10 percent by foreign fleets (the Combs Report scenario [10]), particularly without a major federal action to further restrict foreign competition.

There is the possibility that the U.S. government, sometime in the future, might change the policy which now allows foreign fishermen to catch the groundfish inside the 200 mile limit not taken by U.S. vessels under the quota. This decreased competition from imports would be an incentive for the U.S. fishing fleet to increase production. Such a policy change would undoubtedly result in a significant increase in the price of bottomfish products to the U.S. consumer.

#### Potential Effects of Foreign Investment

Concerns have been voiced in some quarters about the effects of recent moves by large Japanese fishing companies to buy controlling interests in commercial fishing operations in Alaska. Negotiations have accelerated for such purchases since the U.S. fisheries jurisdiction was extended from 12 to 200 miles offshore, and it has even been predicted that Japanese interests will be in complete control of Alaska's fish production and marketing within the next few years.

Japan is a major market at present for the high-value fish, with approximately 70 percent of the king and tanner crab and 50 percent of the frozen salmon being exported to that country. Some operators in Alaska contend that Japanese control of both production and marketing, would affect pricing of high-value fish. One development has been the shipment of reefer containers directly from ports in Alaska to Japan instead of first shipping them to Seattle. It is too early to predict the economic impact of this foreign control, but the Japanese do demand top quality fish and they downgraded substantial quantities of frozen salmon from Alaska during 1979. Such rejections and reduced selling prices are resulting in severe losses for some Alaskan producers (25)\*.

With over 90 percent of bottomfish still being taken by foreign fishing vessels, the Japanese-controlled companies in Alaska have no interest in expanding their U.S. based trawling and processing facilities. This could be a factor in delaying and reducing development of this resource by Alaskan producers. However, it is still anticipated that within the next five years, local production of bottomfish will be successful.

#### Implications of Fishery Analysis to Port/Harbor Development

The implications of this fishery analysis for port and harbor development in the Borough are numerous, and include boat numbers and sizes, locational aspects, potential benefits, and precautions as follows:

- Projections for fishing fleet increases by 1990 are shown in Table II-4. Due to the uncertainties in predictions beyond

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\*The severe price reductions in 1979 have reportedly resulted in major holdings of unsold, frozen salmon in Seattle and Japanese warehouses in January of 1980.

Table II-4. COMMERCIAL FISHING BOATS: 1978-1990

<u>Purpose</u>	<u>Size Range (feet)</u>	<u>Growth Rate** 1978-1990</u>
Salmon gillnetting	30 - 36	5% a year
Salmon seining	47 - 58	5% a year
Salmon trolling	42 - 53	5% a year
King crabbing	97 - 130	None
Bottom trawling	90 - 130	Unknown
Combo crabbing-trawling*	108 - 130	Unknown
Trawling and processing	155 - 165	Unknown
Shrimping	68 - 85	None
Halibut and sable fishing	58 - 80	5% a year

\*Vessels over 200 gross tons (approximately 130 feet) must have licensed skippers and engineers. To avoid this, fishboat owners tend to limit trawlers and crabbers to 130 feet.

\*\*These projections include an increase in the number of limited entry permits in addition to an increase in vessel sizes.

1990, this growth should be carefully monitored by Borough planners or others for continuing port and harbor planning, particularly in light of future limited entry restrictions.

- From a locational standpoint, additional facilities are already needed at Homer for unloading and processing salmon, herring and, potentially, bottomfish. Similar improvements are needed at Port Graham and Seldovia for future bottomfish; at Ninilchik for fleet safety and fish transfer purposes; and in the Kenai-Kalifornski area for fish unloading and transfer. Minimal fishery-related facilities were identified for Seward (the highest capacity Borough port) and none are proposed for the area north of Kenai or for the west side of the Cook Inlet.
- Based on recent analyses (11), the economic benefits to Borough fishermen and laborers involved with bottomfish would be 40 percent of the sale price for harvesting and 25 percent of the sale price for processing. This represents the Alaskan wage and profit component for harvesting and processing cost profits plus allowances for locally provided fuel and supplies. By 1990, for 15,000 tons of catch at \$0.07 per pound and 4,800 tons of processed fish at \$0.60 per pound, these benefits would be \$2,300,000 per year that could be attributed to Borough actions (see Appendix A for benefits under the alternative strategies).
- Based on the state report (11) and NEFCO report (19), the number of plants needed for the alternative production levels would be 1, 2, and 4 plants (see Appendix A). Respective employment requirements for harvesting would be 20, 30, and 60 fishermen and 30, 60, and 120 employees for processing, transportation, etc.



- Precautions related to the fishery analysis revolve primarily around bottomfish. However, the world economy in general and Japan's in particular will continue to affect salmon and crab prices, sometimes significantly as in 1979. These same economic forces will also stimulate the substitution of fish for meat products, with the longer-term result that U.S. and European market demands will undoubtedly grow. Over the short term, freezing plants will probably suffer some setbacks since that technology does not result in a "shelf life" sufficient to weather short-term supply or market swings.

Regarding the bottomfish development, only cautious, first-step capital investments might be undertaken, since all recent indications are that significant harvesting and processing of the species may require a 5- to 10- year evolution. This will probably be true (despite the relatively strong market) unless federal policy actions preclude foreign activities in the 200-mile zone. A planning "flag" that would indicate the need for a reevaluation would be the rise of frozen bottomfish block to \$1.00 per pound or more.

Because of their proximity to the resource, the priorities for port improvements to support the bottomfish developments are Homer, Seldovia, Port Graham, and Seward. Since initial tonnages will be low (30,000 tons of harvested bottomfish by 1990 under the Sustained Development Strategy) only minimal dock improvements to handle a single 130-foot vessel can be justified. These should be public facilities in order to encourage as many small businessmen as possible to engage in this activity. These tonnages and facility requirements are used in the commodity flow and facility cost sections below.

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## RECREATION/TOURISM

Recreational boating--as a separate activity or associated with saltwater fishing--generates about two-thirds of the demands for small boat slips on the Kenai Peninsula. Although not measured separately, recreational use constitutes an even greater percent of total launch ramp use. In addition, since recreational participation is expected to continue to grow in Alaska over the next decade, recreation and the possible growth of tourism represent determinants for the development of Kenai Peninsula Borough ports and harbors. Because they are different in nature, recreation and tourism are discussed separately below.

### Recreation

An Overview. Saltwater boating demands on the Kenai Peninsula are basically determined by the needs of the Anchorage area (6), which has over 90 percent of the total regional population. Thus, most of the existing demand for boating facilities is generated by Anchorage residents. For example, the harbormaster in Seward estimated that 70 percent of total harbor demands--and almost all of the pleasure boat demands--are generated by Anchorage residents, he stated that only a few local pleasure boats were berthed in the 600-slip harbor.

While there are many saltwater bodies near Anchorage, water and weather conditions dictate that most small boat activities take place in three main areas, each with its own characteristics:

- The West Coast--Kenai, Seldovia, and especially the Kachemak Bay area--is considered by local boating authorities to have the best weather and scenery in the region. Fishing is also good, but this area is the farthest by road from Anchorage.

- Seward has the best highway access to Anchorage and the best salmon fishing.
- Prince William Sound has what may be the finest saltwater recreational boating resource in the entire state. Its potential is reduced, however, because of local poor weather conditions in, and the lack of direct road access to Whittier.

Fishing--and therefore saltwater boating--is also popular in other areas of the Cook Inlet. However, small boat usage outside the two main protected bays of the Cook Inlet is limited during much of the year due to poor weather or water conditions.

The Kenai Peninsula's several interior lakes and rivers are used extensively for freshwater boating. According to local boating authorities, KPB freshwater areas are comparatively less important to residents of the Anchorage area than its saltwater areas, since several major freshwater lakes and rivers are much closer to Anchorage than KPB. Nevertheless, the Peninsula's facilities for freshwater boating, while considerably less developed than the saltwater facilities, will probably remain an important portion of the Peninsula's overall recreation mix.

Boating Participation. Currently available figures on recreational "demand" show that about 45 percent of the Southcentral Alaska residents participate in motorboating, and that the per capita participation rate in this activity is 5.7 activity-days per year (1). These data are based on a recreational participation survey, first conducted for the state in 1966-68, and now being updated. If the new results follow general national trends, they will show a significant growth in per capita boating participation rates.

Data collected in the 1966-68 survey did not separate saltwater and freshwater boating. However, freshwater and saltwater fishing were reported separately, with per capita participation rates of 7.7 for freshwater and 2.5 for saltwater. Discussion with boat dealers and boating/sports writers in the Anchorage area indicated a general consensus that saltwater boating represented somewhere between one-third and one-quarter of the total. Thus, use of the fishing allocation between fresh and saltwater is probably reasonable for boating, an allocation which results in an estimated 1.4 per capita participation rate in saltwater boating. Total participation in the Southcentral region in 1978 could, therefore, be estimated at 360,000 activity-days. Using the same type of calculation, freshwater boating may be estimated at 1,110,000 activity days.

Apparently, saltwater boating is closely tied to saltwater fishing. Most Southcentral individuals who boat primarily for the enjoyment of boating and/or in connection with waterskiing prefer freshwater, and there are extensive freshwater boating resources close to Anchorage. Also, freshwater boating is much less expensive than saltwater boating. Because of Alaska's climate and geography, saltwater boating requires considerably larger equipment to assure reasonable safety and the use of more costly materials to resist corrosion. According to local boat dealers, freshwater boating costs only about 25 percent as much as saltwater boating. The considerably higher saltwater boating costs are presumably acceptable because of the lure of saltwater fishing to a small but dedicated group of participants.

Future Boating Demands. Recreation demand analyses conducted by the Division of Parks (1) are based on the assumption that per capita participation rates do not change over time, i.e., growth in demand is due solely to total population growth. Use of the 1966-68 per capita participation rates, therefore, indicate that participation in saltwater

boating in the Southcentral region of Alaska will increase from 360,000 activity-days in 1978 to 675,000 activity-days in 1990.

These calculations probably understate future demands, for three reasons:

- The per capita participation rate is probably in error, and below present values.
- Most national recreation studies have produced results indicating that participation in boating increases with increasing income. Analysis of a recent recreation survey in Orange County, California, indicated that a 2.6 percent increase in constant-dollar personal income would result in an 8 percent increase in per capita boating participation between 1978 and 1990 (3).
- National recreational participation data can also be used to demonstrate a long-term growth in per capita participation in most outdoor recreation activities over and above any growth that can be "explained" by changes in participants' socioeconomic-demographic changes, as determined by multiple regression techniques. The calculations in the previously cited Orange County study showed a time-trend growth rate for boating of an additional 15 percent between 1978 and 1990.

There is also a large "latent" demand for boating in the area. According to the 1966-68 survey, per capita boating participation in the Southcentral region is just half that in the Southeast region, and less than 30 percent of that in the Southwest region. The same survey developed data showing that, statewide, 63 percent of the total

annual boating activity--days took place within participants' neighborhoods--and an additional 10 percent within a one-hour, one-way drive of their residences. The almost complete absence of suitable freshwater or saltwater bodies for boating within the Anchorage metropolitan area undoubtedly accounts for the relatively low per capita boating participation rate in the Southcentral region. Presumably, therefore, development of new boating facilities--or improvements in access to existing boating areas--could markedly increase total boating participation.

Small Boat Facilities in the KPB. Three main small boat harbors serve the saltwater recreational boating and fishing demands of the Kenai Peninsula and metropolitan Anchorage: Seward, with 594 slips; Homer, with 403 slips; and Whittier, with 223 slips. All of these harbors also have launch facilities--ramps and cranes--to accommodate transient boats. Most of the freshwater boat facilities appear to consist of individual small docks, plus small multi-boat facilities at a few resorts and lodges.

These three harbors, with an aggregate of 1220 slips, provide the majority of the established harbor capacity. However, considerable recreational use is also made of the smaller harbor facilities in Soldotna, Ninilchik, Kenai, Seldovia, Port Graham, etc. Transient boats are also served in these areas. In addition, extensive launching is reported at less developed coastal and river locations around the Peninsula, especially during the fishing season.

Of the 1220 total large harbor slips, about 800 are presently occupied by recreational boats (5). The remaining 400 plus are occupied by commercial boats. Individual harbor totals are as follows:



	<u>Seward</u>	<u>Homer</u>	<u>Whittier</u>	<u>Total</u>
Recreational	505	176	123	804
Commercial	89	227	100	416
TOTAL	594	403	223	1,220

Thus, approximately one-third of the small boat slips are occupied by commercial boats, and about one-third of these are charter fishing boats occasionally or always available to sport fishermen. Berths used by these boats are the same as those used for pleasure boats. Apparently, at least in Homer, some local officials believe that separate commercial boat facilities would be desirable.

Each of the major harbors has a backlog of demand in the form of a "waiting list" for slips. This backlog is estimated to be as high as 1000 in Homer, and was reported at 334 in Seward during the summer of 1978. The total backlog in the area probably approximates 2000 (4).

The backlog is probably much higher than the actual unmet demand. Knowledgeable local sources indicate that there is a great deal of double counting--individuals who want only one slip, but have their names on several waiting lists. Also, some people on the waiting lists would probably not actually rent slips when their names reach the tops of the lists; this "unmet" demand may also be temporary. Despite the large waiting list, about 20 slip facilities were unrented in Seward during the winter of 1978-1979 --an indication that many people on the waiting list are not interested in paying rentals during the off-season. In view of all these factors, it would appear appropriate to estimate the "actual" backlog at well below the 2000 figure. For this report, forecasts were based on an "actual" backlog of half the reported backlog.

### Tourism

Present Activities. The most recent visitor census prepared for the State Department of Commerce and Economic Development indicated that 321,000 persons visited Alaska during the summer of 1977, about three-fourths of whom traveled primarily for pleasure purposes (2). Approximately 16 percent of the summer visitors engaged in sportfishing, although the data do not indicate breakdowns between freshwater and saltwater sportfishing, nor between boat and bank fishing.

These data indicate that 12 percent of the summer visitors visited Kenai, 9 percent visited Soldotna, and 5 percent visited Homer/Seldovia. There is undoubtedly much double counting among these Kenai-area visitors, with an unduplicated total of probably not more than 15 percent, or 48,000 visitors who probably fish no more than one day during their visit. In an attempt to confirm this number, we also used State Comprehensive Outdoor Recreation Plan (SCORP) data to allocate a portion of the statewide total to the Southcentral region as follows.

The SCORP indicates that nonresidents accounted for a statewide total of 133,000 boating activity-days. If this statewide nonresident boating is apportioned to the Southcentral region in proportion to total visits, about 95,000 activity-days would be allocated. However, if nonresident boating is proportional to total resident boating, the allocation to the Southcentral region would be about 40 percent, or 53,000 activity-days. This latter figure seems more consistent with the 48,000 mentioned above, so this analysis will be based on an estimate of 50,000 nonresident visitor-days spent in the Southcentral region.

The 50,000 nonresident activity-days for boating represent a rather small proportion of the total boating in the region (identified above under "Boating Participation" as 360,000 saltwater and 1,110,000 freshwater activity-days). If, for example, half the Kenai visitors fished

in saltwater--a very high estimate by national fishing participation standards--the resultant activity-day total of 25,000 is approximately 7 percent of the resident boating. This is a higher percentage than is experienced statewide.

Future Tourist Sportsfishing Demands. There do not appear to be any official forecasts for tourism in Alaska, either by the Department of Commerce and Economic Development, the Division of Parks, or the several Visitor Associations. Tourism has grown at a rate of about 16 percent annually since 1964, but just about all tourism officials concede that growth cannot continue at this rate. There is neither an adequate tourist market nor the facilities available to accommodate them. In the absence of official forecasts, future growth in tourism is assumed to be just half of the 1964-1977 rate, or 8 percent annually. The 1990 nonresident boating activity-days would increase to 85,000 under this assumption. With no public sector support to a maximum support, this growth is estimated to be 4 and 12 percent respectively.

Future Cruise Demands. In 1979, only two cruise ships to Alaska made calls northwest of Haines/Skagway/Glacier Bay: The Lindblad Explorer and the quasi-educational USS Universe, each made three trips. The USS Universe called at Homer, but only with a severe inconvenience to passengers due to an underdevelopment of: 1) docking facilities for USS Universe-type ships and of 2) transport services from the dock to downtown tourist destinations. These ships both serve relatively special and restricted markets, and the regular Inside Passage cruise operators show little interest in extending their cruise patterns.

The future development of the Kenai Fjords National Park may, however, stimulate greater interest in the Kenai coast as a cruise destination in the future. Several observations can be made in this regard (see Appendix B for support requirements):

- If a volume cruise market to Southcentral Alaska develops, Anchorage would almost surely be the nominal end or turn-around point. Presumably, such cruises would involve a much higher percentage of one-way passengers (cruise one-way, fly the other), and Anchorage would be a typical "destination." Even if operating factors do not favor Anchorage, the probable second choice would be Whittier, with its convenient train connections to Anchorage.
- The emergence of Seward, Homer, or Kenai as a port-of-call would require considerably expanded visitor attractions and facilities beyond those presently available, especially when compared with the other main cruise stops--Juneau, Ketchikan, Sitka, Skagway, and Prince Rupert.
- Cruise passengers could possibly be attracted to a half-day sportfishing trip at one or more of the Kenai Peninsula ports, particularly during the salmon season. This would probably require a high degree of success at catching a popular fish, such as salmon and the availability of convenient processing and handling facilities for the fish caught by tourists.
- The local economic impact of a limited number of short cruise ship stops--ten per season, maximum, at least over the next few years--would be \$50,000 to \$100,000 per year.

The future of cruise-type tourism on the Kenai Peninsula appears to be in an entirely new cruise market, rather than in the growth of the well-established Inland Passage market. For example, cruises in Prince William Sound (especially with the proposed State Marine Park system), and cruise-based sightseeing of the Kenai Fjords National Park might develop into important activities. Such cruises would probably be shorter

than Inland Passage cruises--perhaps taking two to four days. They would originate and terminate at Southcentral ports, either as a round-trip, or as a one-way cruise trip with a land return. These vessels would be much smaller than the Inland Passage cruise ships, perhaps on the order of 50 to 200 passenger vessels.

Predicating any major harbor developments in the Kenai Peninsula on future heavy demands on the part of large cruise ships would be risky over the short term. Nevertheless, it would be prudent to ensure that such facilities could be built at a later date if the demand develops.

Implications of the Recreation/Tourism Analysis to Port and Harbor Development

Recreational Saltwater Boating Needs. Preliminary market calculations indicate a potential need for an additional 2100 small boat slips to serve the saltwater recreational boating demands of the Anchorage market plus local markets on the Kenai Peninsula. These figures exclude requirements for charter boats or commercial boats.

The future large-harbor demand is estimated as follows:

		<u>Seward</u>	<u>Homer</u>	<u>Whittier</u>	<u>Total</u>
Existing		505	176	123	804
Future	Low	800	500	200	1,500
1990	Med.*	1,600	900	400	2,900
Demands	High	2,400	1,300	600	4,300
Needed*		1,100	700	300	2,100

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\*Sustained Development Strategy.

This allocation is inexact, to the extent that an appreciable portion of the total demand is probably sensitive to supply, and thus capable of shifting among these harbors--or even to new harbors. Nevertheless, the allocation probably reflects the demand, unconstrained by supply, and is supported by the following considerations:

- The majority of the saltwater boating demand, is derived from the demand for fishing and will probably be allocated in about the same manner as the present demand. This fishing-related demand is not particularly sensitive to supply and access factors, and amounts to well over half the total boating demand.
- That fraction of the total saltwater boating demand that is primarily involved in boating as an independent activity--rather than boating as access to fishing--would presumably be responsive to supply changes and access factors. This portion is less than half the total boating demand.

Only the three larger harbors--Seward, Homer, and Whittier--had a sufficient data base to permit an analysis and projection (5). Undoubtedly, the small recreational demands at other harbors will also increase. If the three big harbors are expanded to accommodate projected future demand growth, demands at the smaller harbors will probably remain in proportion, growing by a factor of about 1.3 times base-year demands.

Future boat size distributions are indicated somewhat by the sizes of currently berthed boats and by the size distribution of boats currently on waiting lists throughout the Borough. These size distributions are shown in the following table by boat length and percent of the currently berthed or wait-listed fleets.

Boat Length (ft)	Percent of Fleet	
	Currently Berthed	Wait- Listed
17-18	34	25
23-24	22	42
32	23	29
40-42	13	3
50-75	6	1
75 plus	2	0

These figures indicate a possible shift out of the 17- to 18-foot and over-40-foot classes and into the 23- to 32-foot classes. Thus, boat sizes are apparently moving from the 17- to 18-foot class to the 23- to 24- foot class or even to the 32-foot class. With the rising energy costs, a smaller demand for the over- 40-foot slips may also be taking place. These figures are only for recreational (not commercial) boats and they are based only on information from Seward and Homer.

Other factors affecting future demands for saltwater boating include accessibility, and future fuel costs as follows. First, this demand is currently limited by the relatively long, residence-to-resource driving time from the Anchorage market area to boating locations. A reduction in this driving time is unlikely, particularly in the absence of a new road to Whittier or the long-discussed causeway leading south from Anchorage across the Turnagain Arm. It is too early to predict the long-term effect of the new harbor developments at Ship Creek in Anchorage.

Second, rapidly increasing fuel prices cloud the future of recreational boating--especially saltwater boating. Boats large enough to be safe for Cook Inlet waters use relatively large amounts of fuel, and with prices heading toward levels from \$1.50 to over \$3.00 per gallon

over the next few years, high fuel costs could well discourage these activities. Opposing arguments include the following.

There is ample evidence that the American public is very reluctant to give up recreational activity participation, even during periods of severe economic stress. Thus, it is unlikely that total boating activity will decrease significantly. On the other hand, there is evidence to indicate that, in response to economic adversity, recreationists seek less expensive forms of their favorite activities. In boating, this price substitution could translate into a shift from expensive saltwater to much less expensive freshwater boating. It is too early to tell, at this time, if such a shift will occur in the 1980s. This possibility must, however, be incorporated into any long-term planning for ports and harbor facilities.

Recreational Fresh Water Boating Needs. Freshwater boating facilities on the Kenai Peninsula are small and in very early stages of development since the main lakes and rivers normally freeze in the winter. Therefore, no attempt has been made to incorporate freshwater facilities into the port and harbor development plan. In general, it may be expected that Kenai residents, owners of vacation cabins/homes, and operators of motels and resorts will add such small dock and ramp facilities as needed to respond to market demands. From a Borough standpoint, the most important consideration is to ensure that adequate launching ramp capacity is added to meet long-term growth in use. No statistical data on ramp needs were found during the course of this project.

Cruise Ship Needs. Visitor-receiving facilities will be needed if cruise activities expand through additional calls by the USS Universe, the Lindblad Explorer, or by new cruise activities around Southcentral points. Because of the relatively small number of tourists likely to be participating in cruise activities, tourist benefits alone could not justify significant harbor improvements. However, if other developments



justify basic improvements at Homer or Seward, additional visitor-receiving facilities could be warranted. Major improvements in hotels/motels, tourist buses, restaurants and attractions would also be needed. It is highly unlikely that major new harbor improvements alone would stimulate a significant increase in tourist activities.

In Conclusion:

- Benefits accruing to the Borough from the development of recreational facilities will be minimal, as they are elsewhere in the country and world. In fact, the costs for recreational boat harbors greatly outweigh the long-term benefits from their use (rental fees, expenditures by boaters in the Borough, etc.). Thus, from the Borough's viewpoint, it is imperative that financing for most such facilities continue to be provided by the State. This financing should include both capital and maintenance costs. Thereafter, benefits that do accrue to the Borough will include construction and maintenance expenditures (financed by the State) and recreational expenditures, in the Borough, for gas, food and supplies. These expenditures are small, about \$5 per visitor-day and of that, only about \$1.50 per visitor-day accrues to the Borough in the form of wages and profits to operators of gas stations, restaurants, or tackle and bait shops. With an estimated 60,000 (20 percent of the 1980-1990 growth) visitor-days per year in 1990, that could be attributed to Borough actions, these benefits would approximate \$90,000 per year.
- Benefits from tourism are very large when compared to those from recreational activities because tourists spend much more for lodging, transportation, food, and local goods or services. However, many goods supporting tourist activities (construction

materials, food, supplies, transport vehicles, etc.) are imported into the Borough, so less than one-half the \$60-80 daily expenditure is estimated to represent benefits to the Borough. With an additional 35,000\* visitor-days, attributable to Borough actions, and an estimate of \$30 per visitor-day, these benefits would be about \$900,000 per year by 1990.

- Employment increases due to recreation growth under the Sustained Development Strategy would be only 5 to 10 new jobs assuming an annual income of \$15,000 to \$20,000. Increases due to tourism activities would be 50 to 80 jobs assuming the same income levels.
- Precautions. The Borough has no control over many factors which influence recreation and tourism. Increasing gas prices and diminishing disposable incomes offset participation rates, and the fact that recreational activities represent such a poor generator of benefits to the Borough may influence private sector investors. Furthermore, tourism (more than any other) requires a close private/public-sector cooperation to ensure the success of development efforts. Thus, while tourist benefits are very attractive and will require relatively small

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\*The 35,000 visitor-days is comprised of 1) a continuing-growth estimate of 20,000 visitor-days, over and above that for the Business-as-Usual Strategy plus 2), an estimate of 15,000 visitor-days in new activities such as conventions, local Kenai Fjord cruises, etc., which can be attributed to Borough actions. However, without a concerted, cooperative government/private-sector effort, this growth is not expected to take place.

capital investments in ports and harbors, other larger expenditures must be carefully coordinated, i.e., those for first-class overnight accommodations, convention facilities, air and road improvements, or the protection of cultural and natural resources.

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## ENERGY AND MINERAL DEVELOPMENTS

### Introduction

This report on energy and mineral developments in the Kenai Peninsula Borough (KPB) is divided into four sections: (1) energy overview, (2) coal, (3) oil and gas, and (4) other minerals. Information and data were derived from discussions with companies active in the KPB area, technical journals, reports prepared by government agencies, and, in particular, specialized newsletters available in corporate libraries (see bibliography).

### Energy Overview

The future development of coal, oil, and gas in the KPB will be controlled by the prices of virtually all forms of energy in world trade but particularly by the price of oil. Although oil represents only one form of energy used, it is the most significant factor in the price formation of all alternative energy forms, and its price is largely controlled by OPEC.

In addition to this basic factor, other government decisions affect the price structure for energy fuels, namely:

- Oil imported to the U.S. determines the price of retail supplies because it represents the marginal barrel cost when domestic prices are controlled, as they have been in the United States to date.\*
- World oil prices affect coal prices because, as the gap between the two fuels increases and the demand for coal accelerates, higher cost coal mines can be opened. This is

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\*See discussion below on the anticipated effects of deregulation.

due to the fact that the opportunity then exists to increase coal prices. Similarly, government mandated coal burning can also bring marginal mines into production.

United States energy policies will have an effect on future developments of energy minerals in the KPB. For example, a continuing shortage of West Coast refining capacity and the lack of an opportunity to sell Alaskan oil to Japan probably could delay rapid exploration and development in Lower Cook Inlet, even if the geologic environment were highly favorable.

A strong mandate to burn coal in the Pacific states could favor Cook Inlet coal if marine transportation costs for Beluga coal are competitive with rail costs from Utah or other western states.

While energy resource development in the KPB is influenced by OPEC oil prices and government policies, other exogenous factors (such as the growth rate of nuclear power in Japan and the tradeoffs there between nuclear energy and oil or coal, and similar policy decisions in South Korea and Taiwan) will have an effect on energy developments in the KPB. Competitive sources of supply--for example, coal from China, Australia, British Columbia and Indonesia--will also influence the economics of coal development in the KPB.

Rising OPEC oil prices and the possibility of accelerating decontrol of U.S. oil prices to meet the equivalent OPEC price will begin to affect supply/demand balances of worldwide energy forms. These future energy prices are very uncertain, but there is an upward trend in energy prices which will ultimately increase energy supplies and depress demands. All of these factors will affect the KPB over the next few years.

## Coal

The focal point of potential coal mining in the KPB is the Beluga field. These coal deposits, which were examined intensively by Utah International and the United States Steel Company in the 1960s, have for several years been under lease to Placer Amex of San Francisco, a wholly owned subsidiary of Placer Development Ltd. of Vancouver. Based on preliminary studies, the minimum economic production level for exporting coal is five million tons per year. The potential use is steam coal for generating electricity.

While the Beluga coals are exceptionally low in sulphur (about 0.2 percent) they are also low in heat value (Btu) and fairly high in moisture content compared with competing coals from other areas. Heat values for coals, which might move to Pacific Coast markets, compare with Beluga coal as follows:

<u>Source of Coal</u>	<u>Heat Value</u> (Btu Per Pound)
Utah	12,660
Colorado	12,660
British Columbia	11,000
China	11,500
Australia	12,500
Beluga	8,000

Thus, Beluga coal has the disadvantage of being a low calorific, subbituminous coal. As discussed below, this low Btu value vitally affects its marketability in the Pacific basin. However, the potential does exist for its use as a coal/oil slurry or for conversion to gas or methanol.

The Japanese Market. Because the Japanese market represents such a good potential for Beluga coal, it is addressed in detail in the following discussion.

Future plans by the Japanese utility industry call for a shift away from fuel oil (because of rapidly rising prices and uncertain supplies) to nuclear power and coal, the latter receiving strong emphasis. From a demand for imported steam coal of slightly more than one million metric tons in 1978, according to the Organization for Economic Cooperation and Development (OECD), the Japanese demand for imported steam coal will rise as follows:

Demand for Imported Steam Coal in Japan  
(Thousands of Metric Tons)

1977	880
1978	1,024
1985	13,700
1990	33,100
2000	76,500

The above estimates are based on a low-growth case for nuclear power. Faced with such large steam coal requirements, Japan must turn to imports, since only 200,000 tons can be produced domestically. Supply and demand for coal in Japan to the year 2000 are shown in Table II-5.

After opening trade with China several years ago, Japan moved rapidly to import Chinese coal--both steam and metallurgical--as well as other raw materials. In 1977 and 1978, 190,000 and 170,000 tons respectively were imported from China. By 1990, the total is expected to rise to 12.7 million tons, and by 2000 to 28.7 million tons (see



Table II-5. JAPAN: COAL DEMAND, INDIGENOUS SUPPLY AND IMPORTS, 1976-2000

(Millions of Metric Tons)

	Demand				Supply			
	Metal- lurgical	Steam	Other	Total	Indige- nous	Imports Metal- lurgical	Steam	Total
1976	68.5	7.3	7.4	83.2	20.4	57.1	2.5	59.6
1985	92.9	13.9	8.6	115.4	19.0	82.7	13.7	96.4
1990	100.0	32.1	9.9	142.0	19.0	89.9	33.1	123.0
2000	114.1	75.7	10.1	199.9	19.0	104.4	76.5	180.9

Note: Demand and supply may not be equal because of stock change accounts.

Source: Organization for Economic Cooperation and Development

Table II-6). In 1979, China sold Japan its Wei-Pei coal for \$26.30 per standard ton (ST) and Ta Tung coal for \$31.07 per ST.

Australia has been the largest exporter of steam and coking coal to Japan. In 1978, some 685,000 tons were shipped to Japan, and by 2000, these shipments could reach 25.9 million tons, a volume very close to that expected to be shipped from China.

Table II-6 also shows Japanese imports from other countries. By 1990, the U.S. could be shipping about three million tons, and double that amount by 2000. Whether this coal would come from Beluga or the western states is dependent on comparative transportation costs (rail and sea) and the varying costs for coal from either strip or underground mines.

Canadian coal trade with Japan began in 1948 with 200,000 tons of metallurgical coal; in 1978, this rose to 10.9 million tons of metallurgical coal. In November 1978, British Columbia sent a trade mission to Japan to encourage the expansion of coal exports and it will expand coal loading facilities at Vancouver and add new facilities at Ridley Island south of Prince Rupert. These new services will be completed in 1983. Because of these actions, coal shipments could reach 11 million tons by the year 2000. Japan did not contract for steam coal from Canada in 1980 because the price was not in line with the maximum \$30 per metric ton (CIF) (\$27.00 per ST) offered by other countries.

Beluga Coal Compared with Western U.S. Coal. A key to marketing Beluga coal will lie in the comparative shipping costs of competing coals to Pacific rim locations. As shown in the following example, the criteria for competing coals will be costs, including FOB and transport costs, per delivered Btu.

Table II-6 JAPAN: STEAM COAL DEMAND\* AND SUPPLY BY SOURCE, 1977-2000  
(Millions of Metric Tons)

	1977	1978	1985	1990	2000
Demand	8,998	10,448	13,900	32,100	75,700
<u>Supply</u>					
<u>Imports</u>					
Australia	4,330	6,848	5,500	11,200	25,900
China	1,899	1,704	5,890	12,700	28,700
USSR	2,313	1,442	260	650	1,650
S. Africa	215	249	30	30	30
Canada	-	-	2,100	4,000	11,400
U.S.A.**	-	-	-	3,000	6,000
Other	41	-	100	500	2,000
Total	8,798	10,243	13,880	32,080	75,680
<u>Indigenous</u>	200	200	--	--	--
Total Supply	8,998	10,443	13,900	32,100	75,700

\*Low nuclear case per OECD.

\*\*Prior to 1977, small quantities were imported from the U.S.

Source: Organization for Economic Cooperation and Development  
Hugh Douglas & Company Ltd.

Beluga coal delivered to the West Coast would have difficulty competing with western U.S. coal for the following reasons. Rail freight rates from Utah and Colorado to West Coast ports are 1.3 to 1.5 cents per ton mile for shipments of about a million tons per year or more, and unloading is about \$2.50 per ton. Using Utah coal as an example of the competition to Beluga coal, costs for shipping 1 million tons of Utah coal to San Francisco would be about \$15.50 per ton, plus \$2.50 for unloading, for a total of \$18.00. To ship the same amount of Beluga coal to San Francisco in a 150,000 dead-weight-ton (dwt) vessel would cost an estimated \$20.00\* (including a \$2.50 unloading cost). Thus, on a tonnage basis, transportation costs are nearly the same. However, taking the heat value of the two coals into account produces a quite different transportation cost, as the following shows:

	<u>Beluga</u>	<u>Utah</u>
Btu per lb	8,000	12,000
Shipping cost per ton	\$ 20.00	\$18.00
Shipping cost per MM Btu (cents)	125	75

In cents per million Btu the shipping costs of Beluga coal are more than 66 percent greater than Utah coal.

Similar circumstances face Beluga shipments to Japan. In this case, foreign registered vessels can be used. The distances from British

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\*Shipping in American registered vessels as required by the Jones Act costs about twice as much as shipping in foreign registered vessels. Moreover, it can be three times as costly as shipping in Japanese vessels. Estimated by H. Douglas & Co. following conversations with major producers/shippers.

Columbian and Australian ports to Japan are very nearly the same--approximately 3500 nautical miles. Using a 50,000 dwt\*\* vessel the total transport costs are:

	<u>Transport Costs to Japan (per ton)</u>		
	<u>Beluga</u>	<u>Australia</u>	<u>British Columbia</u>
Rail	-	\$ 4.00	\$10.50
Shipping	<u>\$9.90</u>	<u>9.90</u>	<u>9.90</u>
Total	\$9.90	\$13.90	\$20.40
Shipping			
cost per MM Btu	\$0.62	\$ 0.56	\$ 0.93

In this case, Australia has a shipping cost advantage; also, mining costs in Australia are lower than in Alaska, which will further widen the difference.

Although Beluga coal has a shipping cost advantage, Canada has an overall advantage in terms of mining costs. Because of high operating costs in a severe environment and the generally high costs peculiar to the Alaskan economy, Beluga mining costs are estimated to be a minimum of 50 percent more than mining in Alberta. The following illustrates the estimated comparative costs:

	<u>Alberta</u>	<u>Beluga</u>
Mining cost (per ton)	\$ 6.00	\$ 9.00
Profit	4.00	4.00
Transport	<u>20.40</u>	<u>9.90</u>
Total	\$ 30.00	\$ 22.90
Delivered costs per MM Btu	\$ 1.36	\$ 1.43

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\*\*Unloading facilities at steam electric sites in Japan can accommodate a ship with a maximum of 55,000 dwt.

From the calculations it can be seen that marketing Beluga coal to Pacific rim countries will be influenced by the low Btu value of the coal, and the high cost of mining in Alaska, both of which affect the costs for an equivalent heat value. Given the small difference above, the rising rail rates and the future possibility that Alaska could be exempt from the Jones Act, Beluga coal could compete with that from Alberta.

Local Markets. A local market for Beluga coal could be for power generation. For example, if the Chugach Electric Association's 250 MW plant currently using natural gas were converted to coal\*, then about 1.5 million tons of coal would be used annually (assuming a heat rate of 8000 Btu's per kwh). It is uncertain whether this quantity of coal is sufficient for the minimum economic productive capacity. If the plant cannot be converted, and assuming a growth in electricity of 10 percent (rather high even for Alaska's rapid growth), a new 250 MW coal-fired plant could be required as early as 1990.

Another possibility is that an aluminum smelter and refinery might be located near Beluga and electric power plants constructed specifically to serve this industry. But here again, the assumed costs would be on the order of 80 cents per MM Btu. Currently, coal delivered from New Mexico mines to Gulf areas, or from Montana to Indiana, costs 70 to 100 cents per MM Btu (FPC data). Thus, aluminum refined in Alaska may not be market competitive in the near-term even in the U.S., since aluminum companies can find less expensive energy elsewhere.

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\*This would be a very expensive conversion that would probably only take place following a very strong federal policy adoption to force such a conversion.

Coal Development Prospects. The evaluation of Belugan coal production has been completed but market studies are continuing. The potential for mining these reserves has been postponed because of aggressive marketing by Chinese and Canadians in non-U.S. markets, and on the West Coast of the U.S., by currently competitive western coal. Additional competition could result from the construction of several coal slurry pipelines to the Pacific Coast currently under consideration. Transportation cost savings with slurry lines would be on the order of 20 cents per million Btu's--an added disadvantage to Beluga coal of \$3.20 per ton. In early 1980, it was reported that Beluga coal might be converted to methanol. This will depend primarily on federal government policy rather than on economics. However, low Btu coal does not compete strongly with methanol from natural gas (mainly by-product gas from oil production), and by-product gas is readily available from Canada, Mexico and the Middle East. Thus, the assessment of this possibility must be made on a continuing basis as policies and world price structures change.

#### Oil Potentials

In addition to global factors discussed in the Energy Overview above, the further development of oil and gas in the Cook Inlet is dependent on several factors:

- Production rates for crude oil from existing wells
- Local demand for petroleum products
- Future drilling in the Lower Cook Inlet
- Future gas production and gas derived products, and
- Deregulation.

Each of these factors is discussed below.

Future Oil Production from Upper Cook Inlet. Beginning in the early 1960s, crude oil production from Upper Cook Inlet rose rapidly, peaking in 1970 at slightly over 80 million barrels of oil per year (BPY). Since then, production has declined to an estimated 54 million BPY and is expected to bottom out at 30 million BPY by 1990, so that enough crude will be available for local markets, leaving roughly 10 million BPY for export (see Figure 2). Thus, movements of crude by tanker from Upper Cook Inlet will drop by about 20 to 25 million BPY (or 55,000 to 70,000 barrels per day). Deregulation could increase production by making secondary recovery techniques economic. However, the long-term baseline would not be reversed or significantly interrupted.

Demand for Petroleum Products. In addition to the output from the 21.8 million BPY refineries, some 10.3 million BPY are moving into Cook Inlet destined primarily for Anchorage. Further, there are some inter-regional products moving to Seldovia, Kenai and Homer which are not expected to increase markedly over the next 10 years.

Since the major portion of refinery output moves by pipeline to Anchorage markets, it will have only a very minor impact on KPB ports in the future.

Future Drilling in the Lower Cook Inlet (LCI). Following the lease sale in LCI in 1978, one well has been drilled that found only noncommercial shows, two wells are currently being drilled and one was spudded in late spring 1979. Marathon, Phillips and ARCO are the operators. In general, optimism among petroleum geologists that a major oil field will be discovered is not high. Without such a discovery, production could at best reach 25 million BPY in the early 1990s based on extrapolations from the Upper Cook Inlet geologic data. (Discussions with industry personnel).



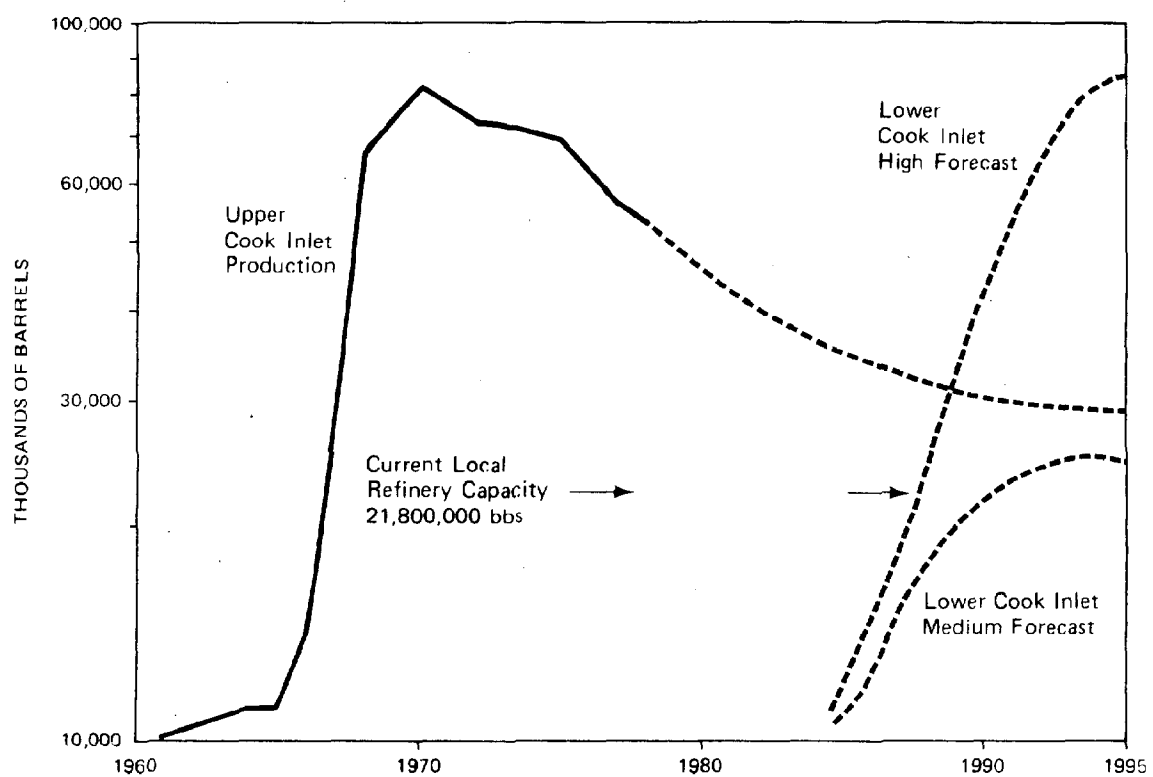


Figure 2. OIL PRODUCTION PROFILE OF COOK INLET, 1960-1995

Effects of Deregulation. The effects of deregulating gas and oil prices on future exploration activity and production in the Cook Inlet will be minor for the following reasons. In the lower 48 states, current demand for drilling rigs is high because new oil/gas prices are providing an incentive to look for new supplies. In offshore areas, where drilling costs are higher than onshore, production potential must be large to justify the exploration investment. The Lower Cook Inlet does not appear to have good potential, and only prices in the range of \$25-30 per barrel are likely to spur a major exploration effort.

An important component of any drilling in LCI is cost, since these waters are expensive to operate in. Should deregulation take place, there will most certainly be an excess profits tax placed on production from old hydrocarbons. These profits would provide some funds for additional drilling, as would increased prices. However, additional drilling efforts would probably move to the North Slope where the ratio of potential production per well to the exploration costs is much more attractive than in the LCI.

Finally, demand for petroleum products in the lower 48 states is changing. In California, for example, gasoline demand may peak out by the mid-1980s. Market saturation, the switch to fuel-efficient autos and diesel fuel, and high gasoline prices may bring about this change in demand. Elsewhere in the lower 48 states, the government's emphasis on coal use for industrial heat will tend to temper the growth in demand for heavy fuels, and gasoline demand will also begin to slow over the next three to five years.

Thus, it is apparent that the oil/gas supply balance is undergoing many rapid changes. None of these changes, however, including deregulation, is likely to significantly affect activities in the Cook Inlet.

### Gas Potentials

Natural gas production rose rapidly from 1960 to 1970, then stabilized at 225 billion cubic feet (BCF) and rose gradually to its current 280 BCF annually. Production is expected to peak at about 300 BCF in the early 1980s and decline thereafter to about 100 BCF by 1995 (see Figure 3). As also shown in Figure 3, natural gas finds in the Lower Cook Inlet (LCI) could start to balance the Upper Cook Inlet (UCI) production by the year 2000.

Alaskan Department of Natural Resources estimates of natural gas reserves in the Upper Cook Inlet were as follows:

	<u>BCF end of 1976</u>
Reserves	5,858
Dedicated	2,613
urea	797
proposed export LNG	991
Alaska uses	825
Uncommitted	3,245

Thus, sufficient gas remains for local uses (30 years plus), and it is quite likely that some natural gas from the North Slope may be available in the future. The 991 BCF for LNG export to the west coast United States is progressing slowly. Pacific Lighting has been attempting to obtain permits for an LNG terminal in California, but continuing delays and rising natural gas prices have encouraged domestic drilling and dampened demand, as have the prospects of new gas supplies from Mexico, Canada and LNG from Indonesia. However, Pacific Lighting is continuing development

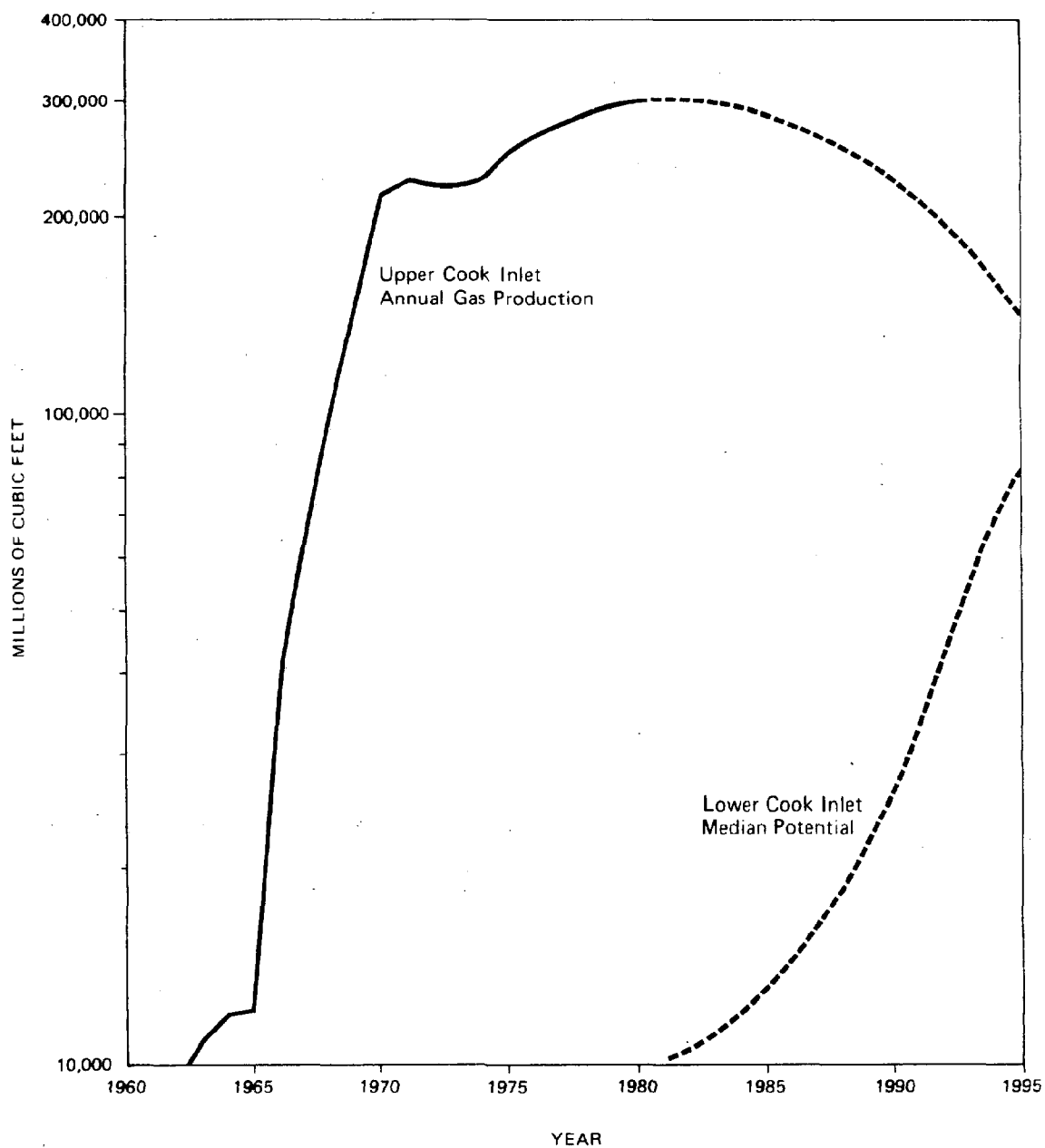


Figure 3. GAS PRODUCTION PROFILE OF COOK INLET, 1960-1995

efforts of its LNG terminal at Point Conception. This effort could result in a new plant in the Nikiski area and require new or expanded dock facilities for plant construction as well as for LNG export.

Natural Gas Products. Union Oil Company is currently converting natural gas from Cook Inlet to anhydrous ammonia and urea. The plant has a capacity of one million short tons per year of anhydrous ammonia, of which half is converted to urea, and half is available for export. Between 750 and 830 thousand short tons of urea are manufactured annually for local use and export.

According to Union Oil, future expansion plans are undefined and cannot be predicted. Future prices will be affected by the wellhead price of gas, which will, in turn, affect gas reserves.

For purposes of this study, one must assume constant production of these natural gas products over the next 15 years with no new port facilities being required.

#### Other Minerals

Several metals, including chrome, copper and gold, have been mined in the past in the KPB. Chrome was mined during World Wars I and II on the southwest tip of the Kenai Peninsula; copper was mined in the Naka Bay area; and gold dredging has been sporadic.

Copper. At the present time, land withdrawals for national forests, parks, and wilderness areas have taken some of these lands--particularly Naka Bay--out of potential mining operations. Copper mining in Alaska is costly, and only copper from high grade (2 percent copper or more) deposits would be able to compete with copper from the lower 48 states and elsewhere, given foreseeable price structures.

Chromite. The low-grade Kenai Borough chrome deposits may again be assessed should major supplies from Turkey, Rhodesia, and South Africa, and to a lesser extent from Russia, be uncertain. However, China has extensive chromite deposits, and Brazil has recently announced discovery of new economic deposits. In each of these countries, the grade of ore is higher than that in Alaska and mining costs are less. Thus, only in the event of national emergencies would chrome be mined in Alaska. In addition, the U.S. strategic stockpile of metallurgical grade is currently 1957 tons, while demand is approximately 600 tons per year. This represents more than a three years' supply if no additional chromite is imported. Thus, it would not appear that these chromite deposits would be developed under conditions other than a long-term emergency.

Gold. Gold prices have been rising dramatically and the outlook is for a continuing increase. As a result, small gold dredging operations worldwide are increasing. No specific interest in gold dredging in the KPB is reported, but it is possible that the old placer areas may see a revival. Any impact on ports from such dredging operations, however, would be minor.

Iron Ore. At Tuxedni Bay, an iron ore deposit was under investigation in the late 1960s by a major oil company. Its proximity to the Cook Inlet natural gas, which could be used as a reductant for producing iron, was a primary attraction of the deposit. However, iron ore is plentiful in world markets. Brazil is currently opening up one of the largest and richest iron ore deposits known, and in the 1980s will be a major supplier. Further, world steel demands will grow more slowly than in the past, and this growth, combined with adequate, low price iron ore on the world market suggest that mining iron ore at Tuxedni Bay is unlikely over the forecast period for this study.

Cement. The construction of a cement plant in Alaska has been under consideration since the early 1960s. In a study of cement production opportunities in Alaska, prepared by the Institute of Business, Economic and Government Research, an area at Iliamna Bay on Cook Inlet was identified as a potential limestone deposit suitable for cement<sup>(1)</sup>. A plant could be located at Tyonek, north of Tuxedni Bay; natural gas would be used as fuel, and the raw material would be barged from the quarry to the plant.

Alaska purchased about 85,000 tons of cement in 1979. About 60,000 tons went to the Anchorage and Fairbanks areas. Consumption has fluctuated widely in recent years, depending on levels of construction activity. For example, during the peak pipeline construction year, consumption reached over 200,000 tons.

Future demands will also be closely related to construction activities. The new gas pipeline construction will undoubtedly create another demand peak, as will the two major proposed dam projects. According to local information, dam construction could create a one-time demand for 100,000 to 200,000 tons for gravel dams, and as much as 400,000 to 600,000 tons for concrete dams.

Technology in the US requires high capacity cement plants to achieve reasonable unit costs. According to industry sources, minimum economic sizes for new plants are in the range of 500,000 to 1,000,000 tons per year. It is possible, however, that alternative technologies may be available to produce cement at reasonable costs in much smaller plants. There are apparently some European plants employing stationary kilns (in contrast to U.S. rotary kilns) with capacities as low as 30,000 tons per year. Presumably the unit production costs of such plants are higher than those of very large plants, but a plant with low unit capital costs

and high operating costs may still be advantageous in Alaska, given the high shipping charges for cement from the lower 48 or foreign sources.

In the short term, it is unlikely that a conventional-technology cement plant will be developed to use locally-mined limestone for the following reasons:

- Even with the two major dam projects, total Alaskan markets are well below the volume required to sustain a U.S.-type plant.
- No single company has--or can expect to have--a 100 percent market share in Alaska, so that total state markets would have to be as much as double the minimum economic output of a single plant to be attractive to one of the major suppliers.

The only realistic alternative for cement production lies in the possible application of a different technology that would permit relatively low unit capital costs. Should such a technology be available, the outlook for local production could improve dramatically. The continuing analysis of this possibility should be undertaken by the Borough Economic Development Office since cement production could affect KPB port developments.

Finally, the fact that the cement markets in the Seattle and San Francisco areas are currently so strong (and no known additional production is anticipated) led to the consideration of exporting Kenai cement to the British Columbia and Seattle areas. Preliminary investigations of this possibility indicate, however, that those markets, although very strong, would not accept the higher production plus



bulk transport costs of cement from Kenai in American vessels.\* That is, the delivered price of Kenai cement could not compete well with the present Seattle price. Since Kenai port or harbor improvements alone would not be sufficient to remedy this disadvantage, it is particularly important that the Economic Development Office reevaluate this potential when:

- Final go-aheads are obtained for the gas pipeline or the Bradley Lake or Susitna dams or when the annual Alaskan market demand reaches 400,000 tons, or
- The Pacific rim markets experience shortages and price increases similar to those in 1978 and 1979, or
- Alaska (like Hawaii) is exempted from the Jones Act restrictions.

#### Implications for Port and Harbor Planning

The preceding minerals and energy analysis indicates that the primary port-related activity should be to prepare contingency plans rather than initiating final port planning or implementation efforts. This is due to the fact that for the projects considered, all requirements for proceeding with port plans have not been met. For example, LNG requirements for the identification of an available resource and a strong market, for transportation system support and for financing have all been met. However, a key requirement (the construction permit for a LNG receiving terminal in California) is still outstanding. Furthermore, the timing

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\*Based on discussions with staff at one of the major west coast cement producers who have prepared recent in-house analyses of that permit production feasibilities in Alaska.

of that permit acquisition is not predictable because court actions are involved. Similarly, the Beluga coal development requirements for identification of an available resource, a strong market and an efficient transport support have not been met. Current international prices of delivered coal from other sources are apparently lower. Additional requirements for a near-term Beluga exploitation include 1) possible Alaskan exemption from the Jones Act, which affects shipping costs, 2) federal government policies regarding power plant conversions from gas to coal, or 3) subsidies for gassification or conversions to methanol.

Contingency planning, on the other hand, is needed to ensure that project implementations can proceed as rapidly as projects become feasible. Projects in this category include (in order of likely priority) the LNG plant at Nikiski, the off-shore oil/gas support base at Cape Starichkof, and a dock/transport system requirement for Beluga coal, cement, etc., in the general vicinity of Tyonek. Since it is not possible to develop port requirements and costs or benefits for these basically uncertain projects, actions at this time should focus on:

1. Ensuring that land requirements can be met through zoning, land trades, options on key parcels, etc.
2. Identifying KPB actions that would support future private-sector activities, such as infrastructural support or facilitating permitting requirements, and
3. Generally working as needed with the private sector to gain state or federal permits or funds for projects that coincide with Borough development goals.

These implementing actions can only be accomplished through continuing Borough efforts, in cooperation with private-sector developers.

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## OTHER DEVELOPMENTS

There are a number of developments outside the Kenai Peninsula Borough which could affect Borough ports and harbors. These potential developments are discussed below on a case-by-case basis.

### Outer Continental Shelf (OCS) Exploration

During the intensive oil and gas exploration of the Northern Gulf of Alaska lease blocks, Seward was one of two major supply bases used by the oil companies. However, disappointing finds in the Gulf led to cessation of exploration activities based in Seward and Yakutat, however, some exploration-related companies still lease city land in Seward. While it is unlikely that this activity will resume in the immediate future, port planning in Seward should include this contingency. Additional lease sales have been scheduled for the Northern Gulf (No. 55, October 1980) but have been viewed unenthusiastically by the oil industry. Unless new geologic information indicates a favorable potential for finding oil or gas, the oil industry may concentrate its efforts on higher priority lease sales like the Beaufort Sea and Lower Cook Inlet.

The Western Gulf of Alaska (No. 48) and Cook Inlet/Shelikof Strait (No. 60) lease sales have a potential to impact Borough ports, particularly Homer and Seward. These sales are scheduled for December 1980 and October 1981, and although Kodiak Island might be the preferred site for the Cook Inlet/Shelikof Strait exploration support, environmental, community relations, and water supply problems may make a suitable site on Kodiak difficult to find. Homer has presented a similar problem to the oil industry in the past, but recent and near future water supply improvements and new city policies make Homer more attractive for a partial support base. Homer is within an easy supply-operating radius for all of the Lower Cook/Shelikof and most of the Kodiak lease sale

blocks. Support activities not permitted or located in Homer should, instead, be located at Anchor Point/Cape Starichkof, where water depths, road access and land are not constrained. In earlier studies, Seward and Rig Tenders Dock at Nikiski were considered for support bases for both sales, although they are outside the easy operating radius for serving the middle and southern lease blocks of the Kodiak lease sale.

Exploration activities would probably commence in the first summer after the lease sale (1981-82). Port uses could range from taking on fuel and water (a service currently provided at Homer) to construction at Cape Starichkof, of a service base with storage area and berth space to handle supply boats (the type of service currently being provided at Rig Tenders dock).

An economic find could create a demand for waterfront platform fabrication, pipe and material storage, and for marine or LNG terminal sites. Should suitable sites on Kodiak be unavailable, Homer and Cape Starichkof or Seward could be used to support these activities.

#### Northwest Alaska Pipeline Project (NWAP)

Northwest Alaska Pipeline Company's proposed natural gas pipeline project offers a potential demand for the Port of Seward. During the Trans Alaska pipeline construction, Seward served as an overflow port to handle large quantities of pipe, supplies, and heavy equipment, amounting to about 15,000 tons in 1977. Thus, NWAP has been studying the Port of Seward's attractiveness in providing a similar service. Such a use of Seward would also involve the Alaska Railroad Dock and adjacent storage area for rail shipment, first to Anchorage and then to Fairbanks. The NWAP construction is currently estimated to begin in 1982 and to be completed by 1985.

Several factors will affect the timing and magnitude of impacts on Seward. Most importantly, NWAP has yet to secure financing for the gas pipeline project. Currently, NWAP is two years behind the original schedule, and construction could not commence until the summer of 1982, with gas delivery beginning in 1985. Continuing delays in financing and regulatory approval could cause further setbacks.

Construction and operation of a multi-purpose port in Valdez could also affect Seward and Whittier. As a currently developing, competing port, Valdez represents a possible port of entry for pipe and other construction supplies being shipped to nearby NWAP construction sites. Thus, the continued development of the port in Valdez could decrease the likelihood that Seward would be the only port involved in the NWAP project.

#### Beaufort Sea Petroleum Exploration and Kuparik Oil Field Development

Oil and gas exploration activities in the Beaufort Sea and the proposed development of the Kuparik oil field represent additional opportunities for the Port of Seward. However, large quantities of pipeline and oversized supplies will probably be barged into the Prudhoe Bay area during summer operations. Basic costs of operations dictate an maximum reliance on this lower cost means of transportation in the future.

Should several of the oil and gas related projects be initiated simultaneously, the demand for material transportation could easily keep primary and overflow ports busy. However, Seward has an excellent capacity and would not necessarily require further development to attract this traffic.

### Bradley Lake Hydroelectric Project

Recently, the Alaska District Corps of Engineers initiated detailed preconstruction studies for the Bradley Lake Hydroelectric Project. A cultural resource survey is underway, and an intensive geologic study is planned for next year. Given favorable site investigation and approvals, construction could begin in three to five years and require a temporary shipment of supplies through the Port of Homer. Because the site has no land transportation connections with Homer, it is possible that heavy construction equipment would be either airlifted from Homer or barged to the end of Kachemak Bay and airlifted to the site, bypassing the port altogether.

The dam itself is projected to be small in size--a penstock tunnel and transmission lines would be the major construction. Therefore, construction materials will be related heavy equipment and transmission facilities, representing a potential for short-term but intensive transport demand.

### Delta Barley Project

It is unlikely that the Delta Barley Project will affect Kenai Peninsula Borough ports. The project is at a stage of determining markets for Alaskan barley, and production volumes do not appear large enough to meet minimum world market supply requirements. An initial test of Alaskan barley in Japan received negative comments, and visiting grain brokers in Anchorage cautioned that a substantial increase in production would be needed before Alaska could enter the Asian or other world grain markets. No schedule has been set for increasing the size of the Delta Barley Project.

During a recent economic development conference in Fairbanks, project spokesmen made a symbolic commitment to use the Valdez port for shipping barley. If a Valdez port facility is operational when markets

and volumes are available, it would be a potentially competitive port for these exports. Even if the Valdez port is never constructed, transportation costs to either Anchorage or Whittier would be less than those to Seward, and both ports would be eager to obtain this traffic.

#### Susitna Hydroelectric Project

The Susitna Hydroelectric Project has the potential to generate a significant demand on the Port of Seward. The Alaska Railroad represents the most feasible means of overland transportation of large equipment and construction materials to the project site. With its excellent rail head and dock facilities, Seward is a likely site for receiving supplies and materials for the Susitna project.

The project is currently entering a 46-month, advanced engineering and design phase. The most optimistic projections place construction startup around October 1983. Depending on whether the project is initiated by the federal government or private industry with State of Alaska support, power could be on line by either 1984 or 1988. State legislative action this coming year may determine the project sponsor and schedule.

#### Boat Building and Repair Facilities

There are no major boat building or repair facilities at any of the Kenai Peninsula Borough ports. Most emergency repairs are performed either on grids located in small-boat harbors or on a beach. Such repairs are limited to low tide periods.

A boat-repair facility, including a marine railway, existed outside the KPB, at Kodiak, a few years ago, but closed due to lack of business. Consequently, most major repairs to the larger fishing vessels are performed in Seattle during the off-season.



According to companies such as Crowley Maritime Corporation, which has extensive operating experience in Alaska and also operates two ship repair facilities in the San Francisco Bay area, the present volume does not justify the investment required to install and operate a ship repair facility in Alaska. Crowley's existing yards require a guaranteed work volume for 60 percent of its available time in order to break even; profits are generated on the remaining 40 percent. Currently, they do not feel they can come close to the 60 percent figure in Alaska.

Based primarily on the potential of the bottomfishing industry, which would be a year-round operation, there are proposals pending concerning the development of a shipyard at Seward and a boat repair facility at Homer. The Seward facility is proposed for the Fourth of July Creek area. The Homer facility is planned for the Homer Fisheries Industrial Park on the Homer Spit.

Since these ventures are dependent directly on OCS activities and the growth of the bottomfishing industry, major investments on the part of the Borough or the cities would entail high risks until the future of the bottomfishing industry is more clearly defined. However, when the future is clear, the KPB could consider an active role in transport-related activities, such as tax relief or granting land for a marine industrial park, in order to improve the financial feasibility of repair facilities to serve the Kodiak and Gulf of Alaska fleets, as well as KPB boats. In addition, a market analysis for boat repair activities could stimulate a closer investigation by private-sector investors.

#### The Fuel Price Differential, Anchorage vs. Kenai Borough

The retail price of fuels (gasoline, heating oils, etc.) at Kenai Borough locations is higher than in Anchorage. For gasoline, the difference is ten to fifteen cents. This differential prevails even though much of the gasoline sold in the Borough is refined and delivered

directly from the refinery at Nikiski, while much of the gasoline sold in Anchorage is piped from the same refinery. If all gasoline sold on the Kenai Peninsula were priced the same as in Anchorage, the savings to Borough vehicle operators would probably be well in excess of \$1.0 million annually.

The reason for the pricing differential between Anchorage and Borough locations probably can be found in the overall gasoline distribution and pricing pattern in Southcentral Alaska. Anchorage is the primary market because the population and economic activities are centered there. It is also the major point of entry for waterborne shipments of gasoline, as well as the terminus for the pipeline from the Nikiski refinery. For these reasons, Anchorage is the center of the gasoline distribution system, and regional pricing is based upon the Anchorage price plus the cost of transportation to the point of sale. Thus, even though the Nikiski refinery does not actually incur the cost of transportation from Anchorage to Borough points, its product is priced as though it did, and, as a practical matter, the refinery has no economic incentive to set prices otherwise.

It has been suggested that the designation of a Borough port as a port-of-entry would have the effect of reducing gasoline prices at Kenai Peninsula locations. Currently, Anchorage is a port-of-entry but none of the Borough ports are so designated (8,9). While it is unlikely that a significant savings could be gained solely by securing a port-of-entry status for one or more of the KPB ports (10), that action could be a first step in attempting to reduce this fuel price differential.

#### Timber/Agriculture Activities

Both agricultural and timber activities have taken place on the Kenai Peninsula, but neither on a large-scale, sustained export basis. Marketing problems for relatively small quantities and other-than-prime

qualities, plus high production costs have been recurring problems. For example, on the Peninsula, there are only about 500,000 acres of Class 1 agricultural land and little or no land in Classes 2 through 5 (2 and 3). Similarly, as mentioned in the Borough's OEDP report (4), of the 1,000,000 acres of timber resources, about 60 percent is marginal due to small diameters or high logging costs. Another 30 percent is fire- or bug-damaged.

Despite high land and production costs, both agriculture and timber activities will continue on a limited basis, particularly as the d-2 selections are accomplished. This is evidenced by the continuing operation of small farms (5) and over 20 sawmills (6) on the Peninsula. However, with the exception of Seward and Tyonek, port requirements can consist of an accessible beach for barge or towing operations such as those on the southern tip of the Peninsula or the northwest Peninsula coast, where timber assemblies on beaches have been used to transport logs across the inlet to Tyonek for processing into chips. Thus, no special port requirements for agricultural or timbering activities are anticipated for this project. Similarly, no additional port facilities are anticipated to meet current or near-future processing activities, such as those for additional mills or particle board production (7).

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## SUMMARY FOR THE DEMAND ANALYSES

There are a number of conclusions regarding the analyses of port and harbor demands that have important implications for the rest of this report. These conclusions are related to the general development of the Borough economy and specific developments in terms of type, size, and locational characteristics.

First, in spite of its early stage of development (1 and 2), its seasonality and cyclical nature (3 and 4), heavy dependency on nonrenewable resources (5 & 6), and variation in views toward growth (7 and 10), the Borough's economy has excellent potentials. As shown in the analyses, these potentials are balanced between nonrenewable and renewable resource developments, are scattered throughout the Borough, and are reasonably in line with the various community goals for development. Some of the potentials (coal, cement, bottomfish) hold promises of nonseasonal employment, higher wages (tourism, coal, cement, LNG, petrochemical), and a broadening of the economic base with coal, tourism, and bottomfish activities.

The implications of this growth to port and harbor developments include the following:

- Port improvements will be needed throughout the Borough. Many will be single-purpose facilities, and no one facility could be so located as to capture most of the Borough's general cargo traffic--no facility serving major shipping lines can be justified in the foreseeable future.
- Some developments could make use of existing or improved facilities, such as bulk coal or cement over the Tyonek wood-chip pier; methanol from coal over the Drift River facility;

timber over improved beaches (no port facility required); and bottomfish over the existing Seward facilities--others like LNG, the petrochemical and Lower Cook Inlet oil/gas finds, or tourism will require single-purpose facilities.

- For the foreseeable future, KPB general cargo ports will be sized in close relation to its population, that is, to handle relatively small tonnages compared to Anchorage.
- To be successful, Borough ports will have to compete effectively with other Southcentral ports, i.e., with Anchorage for general cargo, tourism, and high-value fish processing; with Valdez and Anchorage for oil or gas liquids processing; with Anchorage and Whittier for recreational boating; with Kodiak and Cordova for bottomfish; and even with Anchorage for passenger and general cargo service to Hope, Tyonek, Drift River, etc., due to its imminent hovercraft service out of Ship Creek.

These and other issues from the commodity flow analysis are neglected in the proposed port improvements in Chapter IV.

Finally, while important potentials for development exist, it was not possible to carry out a broad-scale economic analysis of growth potentials. The KPB economy is simply in too early a stage of development. With only a 25,000 population and an economy based on only two primary sector activities\*, oil/gas and fishing, it is neither possible

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\*Recreational boating is not a key activity because it is so dependent on major state subsidies and contributes so little to the KPB economy in the form of wages and profits.

nor appropriate to consider the use of techniques such as input-output, location quotients, shift/shore, or similar techniques. Also, the use of labor multipliers is limited to estimates because of a lack of detailed economic data for the KPB. For example, the economy is so small that no separate regional economic accounts are maintained. Instead, the KPB is included in the labor statistics and economic monitoring/projection activities for the Southcentral region (9). Thus, the port demands identified above can only be handled on a simple, project-by-project basis, and almost all demands can easily be served by improved facilities in existing port sites. Major new site developments in unincorporated areas do not appear warranted.

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### III SHIPPING AND TRAFFIC PROJECTIONS

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#### INTRODUCTION

This section presents a summary of shipping activities in 1979 and an analysis of traffic patterns which is broken into two sections. The first is an investigation of how freight moved up to 1977 and the second is a projection of freight movements during the period 1980 to 2000. The approach taken in the analysis is to view the Kenai Peninsula Borough (KPB) ports as elements in a regional transportation system which includes both overland forms of transportation and the other major ports of South-central Alaska.

An extensive commodity flow analysis was undertaken for this project. In fact, base period data on port cargo volumes were compiled from both published and unpublished reports by the U.S. Army Corps of Engineers and others. An aggregative data series for the years 1967-1977 was extracted from the Corps' annual publication (1), while a commodity-by-origin-destination profile of 1977 receipts and shipments was prepared. This profile was based on a recent compilation of the Corps' port-to-port data by the University of Alaska's Institute of Social and Economic Research (2). Similarly, commodity-by-origin-destination profiles were compiled from unpublished data (6, 7) for Alaska Railroad traffic, and for highway traffic for 1977. Some rail car ferry data (6), Alaska Marine Highway System data (8), and Civil Aeronautics Board data (9) were also collected but not reported because the data were not adequate or useful for analytical purposes. In addition, an

extensive data series on domestic shipping (west coast to Alaska) for the years 1973-1977 was prepared especially for this project by the U.S. Maritime Administration (10).

As indicated above, many of the desirable data for this project were in an unpublished form, inadequate for analytical purposes or simply not available. Of these data, the Maritime and Corps of Engineers assemblies were the most useful, even though the Corps data were not complete. The rail data were the next most useful. Of limited usefulness or reliability were the truck, ferry, and air cargo data.

Given the limited availability of data, the approach was to:

- 1) summarize the most useful data for projection purposes
- 2) make cautious use of the truck, ferry, and air data when possible, and
- 3) estimate cargo flows where no firm or limited data were available (e.g. port movements for Seldovia and Port Graham and air movements to Kenai from Bristol Bay).

As will be shown in the following analyses and in the summary for this report section, the cargo flows in and out of KPB ports are very low--so low, in fact, that needed port improvements in the following Chapter IV were based on minimal practical improvements rather than on the volume of general cargo flows over the predictable future.

These commodity analyses are: 1) highly summarized in the following discussions, 2) more broadly summarized in the Statistical Appendix to this report, and 3) presented in detail in the Statistical Appendix.

## PRESENT SHIPPING SERVICES

Sea-Land provides twice weekly service between Seattle and Anchorage, and weekly service between Seattle and Kodiak, carrying practically all cargo in its own 35' and 40' containers. Sea-Land also operates its own trucking company, Sea-Land Freight Service Inc., for distributing cargoes within Alaska.

TOTE provides twice weekly service between Tacoma, Washington, and Anchorage. Both TOTE ships in this service are roll-on/roll-off (RO/RO) vessels. Therefore, all cargo is carried on chassies only. TOTE contracts with local trucking firms for their deliveries and pick-ups in Alaska.

Crowley Maritime Corporation operates the Hydro-Train Service between Seattle and Whittier. All cargo is carried on railroad cars on the deck of two barges towed by a single tug. The Alaska railroad delivers the cars from Whittier to destinations in Alaska. Crowley also operates a covered barge from Portland, Oregon to Seward, Alaska. On the return leg, the barge carries urea from the Union Chemicals Division plant near Kenai to Sacramento, California.

All three carriers project only moderate growth of approximately 7 percent annually in Alaskan trade during the next few years, although cargo volumes have dropped by 35 percent over the last two years. TOTEM claims to be operating at a substantial deficit. Both TOTEM and Sea-Land are satisfied with calling at Anchorage only and trucking their cargoes to points in the Kenai Borough. Sea-Land feels that the Anchorage terminal is good for at least another 10 years without any expansion.

Since there are presently no competitors on the horizon who plan to call at KPB ports, it is more profitable for both carriers to operate

through Anchorage. This is especially true of Sea-Land which operates its own trucking company in Alaska. As the result, Borough cities such as Kenai and Homer pay a transportation premium on all groceries, household goods, etc. delivered through the port of Anchorage. The cost of delivering a standard 40' container from Anchorage to Kenai is approximately \$480; to Homer approximately \$700; and to Seward \$380. Considering shipping 40,000 lbs. of frozen fish to Seattle, utilizing the Alaskan Railroad/ Hydro-train tariff, the cost of such shipment from Seward and Anchorage would be \$1,220; \$1,836 from Kenai and \$2,012 from Homer.

The shipping companies estimate that 75 percent of their northbound cargo remains in Anchorage and maybe only 5 percent goes to the Kenai/Soldotna/Homer area. According to the shippers, this volume does not warrant a separate call even if adequate facilities were provided at either Homer or Kenai. They suggest that the shipment of 50 containers to either of these locations could warrant a separate stop.

## CURRENT TRAFFIC PATTERNS

An analyses of commodity movements by all modes was conducted for the purposes of this project. They are presented on a modal basis in the following discussions.

### Ports

A primary objective of the analysis of 1977 port traffic was to establish a base from which to project annual port handlings by commodity group through the year 2000. The KPB is, in a transportation context, an integral part of the Southcentral Alaskan economy, so tha analysis includes the major regional ports of Anchorage, Whittier, and Valdez.

The volume handled by each individual port is shown in Table III-1, based on U.S. Army Corps of Engineers data. These statistics probably understate the importance of some of the KPB general cargo ports, since the Corps does not include tonnages moved by commercial fishing vessels or by the State Ferry. In addition, data published by the State report numbers of vehicles and passengers but not tons of specific commodities.

Ports which primarily serve the petroleum and gas industries were statistically more important than the general cargo ports in 1977, as shown in Table III-1. In addition, about 80 percent of the waterborne tonnage moving through regional ports used specialized, single-purpose facilities; these are privately owned for exclusive use and are not available for handling general cargo. For this reason, the analysis of waterborne freight movements is focused on general cargo ports.

The general cargo tonnage through KPB ports represented only a small fraction of that same type of tonnage passing through Anchorage and Whittier, as shown in Table III-1. (Commodity details by port are shown in the Statistical Appendix). Also, Seward was the primary non-petroleum port serving the Borough in 1977, handling about 40 percent

Table III-1. TRAFFIC VOLUMES, SOUTHCENTRAL ALASKA PORTS, 1977  
(Thousands of Short Tons)

	Crude Petroleum and Products	% of Total	General Cargo	% of Total	Totals
<u>Inbound</u>					
Anchorage	1,071.1	46	1,056.8	73	2,127.9
Valdez	222.1	9	11.7	1	233.8
Whittier	53.6	2	287.0	20	340.6
KPB Ports					
Seward	22.1	1	36.6	3	58.7
Homer	43.8	2	2.6		46.4
Nikiski	904.5	39	17.6	1	922.1
Drift River	12.8	-(3)	16.9	1	29.7
All other	11.5	-(3)	19.5	1	31.0
Sub-Total KPB	994.7	42	93.2	6	1,087.9
Total Inbound	2,341.5	100	1,448.7	100	3,790.2
<u>Outbound</u>					
Anchorage	1,047.4	5	1,219.5	74	2,266.9
Valdez	10,653.7	50	13.2	1	10,666.9
Whittier	86.2	-(3)	327.8	20	414.0
KPB Ports					
Seward	-(1)	-(3)	31.5	2	31.5
Homer	0.6	-(3)	14.4	1	15.0
Nikiski	3,147.4	15	18.5	1	3,165.9
Drift River	6,147.3	29	1.5	-(3)	6,148.8
Cook Inlet <sup>(2)</sup>	176.9	1	10.5	1	187.4
All Other	36.3	-(3)	2.9	-(3)	39.2
Sub-Total KPB	9,508.5	45	79.3	5	9,587.2
Total Outbound	21,295.8	100	1,639.8	100	22,935.6

Notes: - Fish landed by commercial fishing vessels are presumably excluded.  
- Totals may not add because of rounding.  
- Other ports either had insignificant tonnage or were not listed in source data.

(1) Less than 50 short tons

(2) Platforms

(3) Less than 1.0 percent

Source: U.S. Army Corps of Engineers, "Waterborne Commerce of the U.S., Port to Port Series," (unpublished), 1977.

of both inbound and outbound general cargo tonnage. The balance of the general cargo moved either through Homer or over one of the petroleum terminals. Only minor general cargo tonnages moved through other ports. (If fish from commercial fishing vessels and general freight from the State Ferry system were included, such ports as Seldovia or Port Graham could be statistically significant. However, these data were not available from the Corps nor the State, and could not be collected during the term of this study.)

The 1977 statistical record appears to be representative of the "normal" mix of commodities and shares by port of freight movements in the late 1970s. Thus, it is a reasonably valid base from which to project cargo handlings by port, excluding the movement of fish through some of the KPB ports and cargo movements on the State Ferry system, which are not reported.

#### Railroads

Intrastate rail traffic in Southcentral Alaska in 1977 centered on Anchorage as either an origin or destination point. For example, the Alaska Railroad originated\* a total of 732,000 tons, of which less than five percent was originated in the KPB; about one million tons were terminated\* and, of this total, less than five percent was destined for KPB ports. See Tables 3-2 and 3-3.

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\*The term "originated" means that the origin of this tonnage was on an Alaska Railroad line, rather than being part of a transshipment that originated off the Alaska Railroad lines or possibly outside Alaska. Similarly, the term "terminated" means that the tonnage was destined for a point on the Alaska Railroad system rather than being part of a transshipment. It is because of these definitions that the tonnages "originated" on the system will not necessarily equal the tonnages "terminated" on the system. These terms were used because of the special focus on "originating" or "terminating" tonnages in the KPB.

Table No. III-2. ALASKA RAILROAD INTRASTATE TRAFFIC, 1977  
(Thousands of Short Tons)

	Seward	Other KPB	Anchorage	Other South Central <sup>(2)</sup>	Total
Petroleum					
Chemical Products	0.2	0.1	8.4	- (1)	8.7
Petroleum Products	0.0	2.6	7.8	0.9	11.3
Ores, Minerals	15.2	0.2	678.7	1.1	695.2
Stone & Concrete Products	0.0	0.6	34.8	1.5	36.9
Metal Products	9.4	2.5	15.6	2.9	30.4
Machinery, Transpt. Equip.	1.6	1.0	37.3	3.9	43.8
Logs & Wood Chips	7.4	0.0	0.0	0.0	7.4
Lumber	0.9	5.0	44.1	3.1	53.1
Pulp & Paper	0.0	0.0	12.0	0.0	12.0
Fish & Farm Products	0.0	(1)	37.5	4.7	42.2
All Other	<u>0.1</u>	<u>0.1</u>	<u>15.9</u>	<u>0.2</u>	<u>16.3</u>
Total	34.8	12.1	892.1	18.3	957.3
% of Total	3.6	1.3	93.1	2.0	100.0
<u>Originated</u>					
Chemical Products	0.0	32.7	0.0	0.0	32.7
Ores, Minerals	0.0	0.0	0.0	676.7 <sup>(3)</sup>	676.7
Metal Products	0.0	0.0	5.3	0.0	5.3
Machinery, Transp. Equip.	0.0	0.0	1.4	0.0	1.4
Logs & Wood Chips	0.0	0.0	0.0	7.4	7.4
Fish & Farm Products	0.7	0.0	5.2	0.0	5.9
All Other	<u>0.0</u>	<u>0.0</u>	<u>2.4</u>	<u>0.0</u>	<u>2.4</u>
Total	0.7	32.7	14.3	684.1	731.8
% of Total	- (4)	4.5	2.0	93.5	100.0

Notes: Totals may not add because of rounding.

(1) Less than 50 short tons

(2) Whittier, Valdez (via car ferry)

(3) Sand and Gravel, Wasilla/Palmer to Anchorage

(4) Less than 0.05 percent

Source: Alaska Railroad, University of Alaska, Institute of Social and Economic Research.



Table No. III-3. ALASKA RAILROAD INTERSTATE TRAFFIC  
BY GATEWAY,\* 1977  
(Thousands of Short Tons)

<u>Commodity</u>	<u>Anchorage</u>	<u>Whittier</u>	<u>Seward</u>	<u>Total</u>
Petroleum Products	499.0	10.8	0.6	510.4
Chemical Products	1.7	20.9	1.3	23.9
Ores and Minerals	5.0	19.8	0.3	25.1
Stone, Glass and Concrete Products	39.2	41.9	0.4	81.5
Fabricated Primary Metal Products	19.8	40.3	5.6	65.7
Machinery and Transp. Equip.	3.9	71.4	3.6	78.9
Lumber, Forest Products	7.6	65.8	7.0	80.4
Pulp and Paper Products	0.0	13.4	0.1	13.5
Foodstuffs	20.1	49.9	0.5	70.5
Commodities, N.O.S.**	<u>34.5</u>	<u>25.0</u>	<u>0.6</u>	<u>60.1</u>
TOTAL	630.8	359.2	20.0	1010.0
Percent of Total	62.4%	35.6%	2.0%	100.0%

\* Inbound plus outbound totals

\*\*N.O.S.--Not otherwise specified

Source: Alaska Railroad, University of Alaska, Institute of Social and  
Economic Research.

The intrastate rail tonnage for 1977 in the Southcentral region consisted primarily of sand and gravel from Palmer/Wasilla to Anchorage; this movement accounted for 92 percent of the originating and 71 percent of the terminating tonnages. If sand and gravel carryings are disregarded, the KPB share of the loaded or originated tonnage was 61 percent, and its share of the unloaded or terminated tonnage 17 percent. The large KPB share of originated tonnage was primarily the result of chemical product shipments. Commodity and geographic patterns are summarized in Table III-2, and details are presented in the Statistical Appendix.

The position of Anchorage as the hub of the Southcentral regional rail transportation system is apparent in the pattern of Alaska Railroad interstate traffic routings. In 1977, the Railroad handled about one million tons of interstate freight. Almost two-thirds moved through Anchorage and one-third via Whittier to or through Anchorage. The Seward share in 1977 was two percent. The shares by port and commodity mix are summarized on Table III-3, and details are shown in the Statistical Appendix.

#### Highway

Data on highway freight movement patterns in the KPB and Southcentral Alaska are fragmentary, but a 1977 sample of origins and destinations for truck traffic on two KPB highways confirms other evidence that Anchorage is the regional trucking hub and distribution center. Of the truck freight in the sample originated in KPB, 80 percent had an Anchorage destination; of the truck freight terminated in the KPB, 89 percent originated from Anchorage. Origin-destination patterns from these samples are summarized in Table III-4, and details are presented in the Statistical Appendix.

#### Air Cargo

Statistics on air cargo patterns were not available for inclusion in this analysis at the same level of detail as for water, motor and rail

Table III-4. MOTOR FREIGHT TRAFFIC PATTERNS, KENAI PENINSULA BOROUGH  
POINTS, 1977 SAMPLES

<u>From</u>	<u>To</u>	<u>Short Tons</u>	<u>Percent of Short Tons</u>
Moose Pass	Anchorage	543	24
	Kenai	<u>1,729</u>	<u>76</u>
	Subtotal	2,272	100
Seward	Anchorage	7,244	62
	Kenai	3,532	
	Homer	544	5
	Other	<u>326</u>	<u>3</u>
	Subtotal	11,646	100
Kenai	Anchorage	77,267	84
	Moose Pass	2,044	2
	Seward	8,520	9
	Homer	386	*
	Other	<u>3,856</u>	<u>4</u>
	Subtotal	92,073	100
Homer	Anchorage	5,676	82
	Seward	1,196	17
	Kenai	<u>92</u>	<u>1</u>
	Subtotal	6,964	100
All of the above to	Anchorage	90,730	80
	Kenai	5,353	5
	Homer	930	1
	Seward	9,716	9
	Moose Pass	2,044	2
	Other	<u>4,182</u>	<u>4</u>
All KPB Terminations	Total Sample	<u>112,955</u>	<u>100</u>

\* Less than 0.5 percent.

Note: Totals may not add because of rounding

Source: Alaska Department of Transportation and Public Facilities --  
unpublished data

Table III-4. MOTOR FREIGHT TRAFFIC PATTERNS, KENAI PENINSULA BOROUGH  
POINTS, 1977 SAMPLES (continued)

<u>From</u>	<u>To</u>	<u>Short Tons</u>	<u>Percent of Short Tons</u>
Anchorage	Moose Pass	1,479	41
Kenai		2,044	56
Other		<u>101</u>	<u>3</u>
Subtotal		3,624	100
Anchorage	Seward	17,300	64
Kenai		8,520	32
Homer		<u>1,196</u>	<u>4</u>
Subtotal		27,016	100
Anchorage	Kenai	133,545	95
Moose Pass		1,729	1
Seward		3,532	3
Homer		92	*
Other		<u>1,685</u>	<u>1</u>
Subtotal		140,583	100
Anchorage	Homer	43,689	89
Seward		544	4
Kenai		386	2
Other		<u>801</u>	<u>5</u>
Subtotal		15,420	100
Anchorage	All of Above	166,013	89
Kenai		10,950	6
Homer		1,288	1
Seward		4,076	2
Moose Pass		1,729	1
Other		<u>2,589</u>	<u>2</u>
All KPB Terminations	Total sample	<u>186,643</u>	<u>100</u>

movements. Typically, air cargo consists of small shipments of valuable and time sensitive commodities which are not amenable to shipping via surface vessels. Furthermore, it is unlikely that air cargo (such as for the Bristol Bay fly-in of salmon) will significantly affect future port requirements.

## PROJECTED TRAFFIC PATTERNS

Cargo volumes by port were projected from the 1977 base year by applying growth assumptions of the Sustained Development Strategy to individual commodities or commodity groups. These were as follows:

1. General cargo. The general cargo trade for the KPB and other Southcentral ports is estimated to increase at the same rate as for the general economic activity and related population growth.\* Using employment as an indicator of economic activity, the rate of growth between 1977 and 2000 for Southcentral Alaska, excluding Anchorage, is estimated to be about 2.6 percent per year.\*\* For Anchorage, the average rate of growth is projected at 3.9 percent per year. The 2.6 percent per year increase in the level of economic activity in the KPB is consistent with the expansion of current activities under the Sustained Development Strategy. The projection, therefore, assumes implementation of this strategy alternative. See Table III-5 on page 3-16.

The port improvements included in the Sustained Development Strategy are assumed to facilitate the movement of general cargo over docks at Homer and at a Central Peninsula point and involve barge links to Anchorage,

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\*This implies no significant change in the "mix" of current economic activities or in the rate of consumption of consumer goods.

\*\*These projections are from the Intermediate Base-case forecast contained in the draft report, "Northern Gulf of Alaska Statewide and Regional Population and Economic Systems Impact Analysis," dated March 1979, prepared for the U.S. Department of Interior, Bureau of Land Management, Alaska Outer Continental Shelf Office, by the University of Alaska, Institute of Social and Economic Research.

Kodiak, or other regional ports. Because of the relatively small (25,000), widely distributed nature of the KPB population and the lack of a single collection/distribution center for general cargo, no other basic modal shifts can be postulated for this project. Even the proposed roll-on/roll-off (RO/RO) operation out of Homer and/or the Central Peninsula will require a concerted public/private-sector effort to be successful.

2. Petroleum products. The demand for refined petroleum products is assumed to increase at the same rate as general economic activity, with the relationship between locally refined and imported products continuing as in the recent past. The introduction of pipeline shipments to Anchorage may invalidate this assumption, but since this movement is over private facilities, the implications for public-user ports in the KPB would be insignificant. Neither the LNG plant nor the petrochemical facility (based on gas liquids) would change this long-term assessment.\*

3. Crude Petroleum and LNG. As discussed in Section II, without new finds, crude production in Cook Inlet and on the North Slope is expected to decline during the forecast period. This decline, while involving large tonnages, will not significantly affect the common-user public facilities in the KPB or other parts of the Southcentral Region. The minimal impact is due to the fact that the commodities involved move over private, specialized docks.

4. Fish Products. The tonnages of high value and bottomfish products are specifically identified in Chapter II above and in Appendix A (see the Business-as-Usual and Sustained Development Strategy summaries). They include a continued growth in current salmon and herring movements

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\*The short-term construction of either or both plants could require related general cargo shipments, but their construction using prefabricated modules will tend to minimize such requirements.

Table III-5. SUSTAINED ECONOMIC CARGO PROJECTIONS: DEVELOPMENT STRATEGY  
(Thousands of short tons)

	1977 (Actual)	1980	1985	1990	1995	2000
<u>INBOUND</u>						
<u>Kenai Peninsula Ports</u>						
<u>Seward</u>						
Petroleum & Products	22.1	23	25	29	31	35
All Other	36.6	38	42	48	52	58
Total	58.7	61	67	77	83	93
<u>Homer</u>						
Petroleum & Products	43.8	45	50	57	62	69
All Other	2.6	3	6	6	8	8
Total	46.4	48	56	63	70	77
<u>Nikiski</u>						
Petroleum & Products	904.5	907	913	923	929	939
All Other	17.6	18	29	34	39	45
Total	922.1	925	942	957	968	984
<u>All Other KPB Ports</u>						
Petroleum & Products	24.3	25	25	26	26	27
All Other	36.4	37	45	53	59	68
Total	60.7	62	70	79	85	85
<u>All KPB Ports</u>						
Petroleum & Products	994.7	1,000	1,013	1,035	1,048	1,070
All Other	93.2	96	122	141	158	179
Total	1,087.9	1,096	1,135	1,176	1,206	1,249
<u>Other South Central Alaska Ports</u>						
<u>Anchorage</u>						
Petroleum & Products	1,071.8	1,151	1,278	1,681	2,008	1,457
All Other	1,056.8	1,136	1,360	1,659	1,980	2,424
Total Anchorage	2,127.9	2,287	2,738	3,340	3,988	4,881
<u>Whittier</u>						
Petroleum & Products	53.6	55	61	70	96	85
All Other	287.0	295	327	373	408	458
Total Whittier	340.5	350	388	443	484	543
<u>Valdez</u>						
Petroleum & Products	222.1	239	286	349	417	510
All Other	11.7	13	16	20	14	19
Total Valdez	233.9	251	300	366	437	535



Table III-5. SUSTAINED ECONOMIC CARGO PROJECTIONS: DEVELOPMENT STRATEGY (concluded)  
(Thousands of short tons)

	1977 (Actual)	1980	1985	1990	1995	2000
<u>OUTBOUND</u>						
<u>Kenai Peninsula Ports</u>						
<u>Seward</u>						
Petroleum & Products	*	*	*	*	*	*
All Other	31.5	32	33	33	34	34
Total	31.5	32	33	33	34	34
<u>Homer</u>						
Petroleum & Products	*	*	*	*	*	*
All Other	14.4	15	20	27	29	31
Total	14.4	15	20	27	29	31
<u>Nikiski</u>						
Petroleum & Products**	3,090.1	2,410	2,800	2,800	2,800	2,800
All Other	18.5	21	40	68	74	80
Total	3,108.6	2,431	2,849	2,868	2,874	2,880
<u>Other KPB Ports</u>						
Petroleum & Products	6,418.4	5,006	6,700	6,700	6,700	6,700
All Other	15.1	21	22	23	24	25
Total	6,433.5	5,027	6,722	6,723	6,724	6,725
<u>All KPB Ports</u>						
Petroleum & Products	9,508.5	7,416	9,500	9,500	9,500	9,500
All Other	79.5	89	115	151	161	170
Total	9,588.0	7,505	9,615	9,651	9,661	9,670
<u>Other South Central Alaska Ports</u>						
<u>Anchorage</u>						
Petroleum & Products	1,047.4	1,126	1,348	1,645	1,964	2,404
All Other	1,219.5	1,311	1,569	1,914	2,285	1,797
Total Anchorage	2,666.9	2,437	2,917	3,559	4,249	5,201
<u>Whittier</u>						
Petroleum & Products	86.2	93	111	135	161	197
All Other	327.8	353	422	515	615	753
Total Whittier	414.4	445	533	650	776	950
<u>Valdez</u>						
Petroleum & Products	10,653.7	72,263	88,000	69,000	49,000	37,000
All Other	13.2	14	17	21	25	31
Total Valdez	10,666.9	72,277	88,017	69,021	49,025	37,031

\*Less than 50 short tons

\*\*Includes urea and ammonia

Source: WCC

and the new traffic out of Homer and Seward of bottomfish products and wastes. Without a new fish waste processing plant in the Homer or mid-peninsula area, fish wastes are assumed to continue to be trucked to Seward.

The projections shown in Table III-5 for nonpetroleum cargo through KPB ports probably understate the handlings which would occur under the Sustained Development Strategy. This is due to the fact that existing data on current intrastate waterborne trade are incomplete, and only sample data exist for highway traffic which could potentially be diverted to water movement. For these reasons, the projections in Table III-5 are considered to be conservative.

The analyses above point to several important facts regarding current and future port activities in the KPB. These points can be summarized as follows:

- With the exception of Seward, and because KPB ports serve only those activities in and immediately around the Borough, earlier and future port activities are restricted to serving KPB activities. The KPB has no hinterland outside its boundaries that can affect the near-term growth of its general cargo ports. Private facilities will have no major, long-term effects on KPB general cargo ports.
- No KPB port currently acts as a central collection/distribution point for general cargo. Given the commodity projections above and the spatial distribution of KPB ports, no one port is likely to perform such a function by 1990. General cargo tonnages at Nikiski are so small, about 100,000 tons by 1990, that R0/R0 tug/barge operations will only be marginally feasible. The general cargo movements of about 500,000 to 1,000,000 tons annually,

necessary to support a lift-on/lift-off container facility, are not possible over the study period without the kind of growth described for the Accelerated Growth Strategy. Within the South-central region, and under the Sustained Development Strategy, Anchorage will probably continue to act as the collection/distribution hub for general cargo.

- The multimodal commodity flow analyses indicate no modal or route shifts (except for the marginal Homer/Central Peninsula RO/RO operation) that would have a major effect on KPB ports by 1990. While inbound and outbound tonnages are insufficient to require other than minimum facilities, significant improvements are needed throughout the Borough. Even the RO/RO operations might provide the basis for capturing either unforeseen or unpredictable future traffic that would require larger facilities.

- Significant improvements are needed to support:

- potentially growing salmon and herring landings in city ports or harbors

- potential bottomfish activities in Port Graham, Seldovia, Homer, or Seward

- offshore activities at Seldovia, Homer, and Point Starichkof

- the LNG and/or petrochemical facility in the north Kenai area

--coal, cement, or coal products and the related community  
at Tyonek, and

--special marine construction/repair or other projects at  
Seward or Homer.

Recreational boating facilities could be expanded throughout the Borough but should be given careful consideration, as will be explained below in the economic feasibility analysis.

Importantly, the commodity flows described above cannot always be used by themselves to limit potential port developments. Special federal policies (for coal/methanol conversions or excluding foreign fleets from U.S. bottomfishery); special non-location-specific projects (the petrochemical facility); very aggressive marketing (for shipbuilding or tourism); etc., can affect general cargo port requirements. Such opportunities cannot be overlooked.

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SITE AND FACILITY REQUIREMENTS

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The object of the following port-by-port discussion is: 1) to identify the conceptual feasibility of improvements needed to support the developments analyzed in Chapters II and III, and 2) to identify the 1979 constant-dollar public-sector costs for improvements as input to the feasibility analysis in Chapter V. As mentioned in Chapter III, needed port improvements range from single-purpose piers that will be financed by private industry to minimum-size general cargo facilities that could be developed by the Kenai Peninsula Borough (KPB).

In meeting the objectives stated above, the approach will be to:

- 1) describe the existing site and existing facilities, if any
- 2) summarize port or harbor requirements from the demand analysis in Chapters II and III (see also Appendix A)
- 3) identify needed port and related improvements based on a comparison of demands and existing capacity, and
- 4) assemble 1979, public-sector, constant-dollar costs for needed improvements.

Not detailed below are a) improvements that would be financed by private-sector developers (feasibility analyses deal only with costs and benefits attributable to the KPB) or b) projects whose feasibility has been or is being determined by the cities. This latter group includes the Fourth-of-July Creek project in Seward, the small-boat harbor in Kenai and the port/industrial park in Homer.

The harbor developments discussed below are designed to enable the Borough to implement the Sustained Economic Development Strategy summarized in Chapter I and described in detail in Appendix A.

## HOMER

### Existing Port Facilities

Homer has a deep-draft pier and a small-boat harbor, owned and operated by the City of Homer and administered by a harbor-master. The city pier and the 410-foot main face of the pier are located at the end of Homer Spit. The main face of the pier has about a 25-foot depth alongside (at MLLW); the 140-foot N.W. face, also with a 25-foot depth alongside, is used primarily for mooring a Coast Guard cutter; the 60-foot S.E. face has approximately a 12-foot depth alongside. The Alaska Marine Highway ferries call at this terminal, as do rig tending boats serving the drilling platforms in the Cook Inlet. Based on the use of the 410-ft face by 10,000 DWT vessels, the general cargo capacity is estimated to be 150,000 tons per year maximum. Potable water is available at the pier, and gasoline and diesel fuel are available by truck.

The small-boat harbor, protected by a breakwater, is located just N.W. of the city pier. It has a dredged basin of approximately 1790 feet long by 400 feet wide and an entrance channel maintained at -15 feet at MLLW by the Corps of Engineers. The depth in the basin varies from -15 feet to -12 feet. The small-boat harbor has moorage for about 400 vessels with some transient spaces available. A floating fuel pier has gasoline and diesel fuel. A 168-foot long grid for boat repairs and a boat launching ramp are also available, as is a fish unloading pier operated by the city.

Services to the port are limited but adequate, with the exception of road access (1), and planning is underway to repair the spit road where damaged by wave action.

#### Proposed Port Facilities

The conceptual Homer port expansion, shown on drawing number SK-2, is based on current and future needs for both commercial and recreational facilities. If desirable, the small-boat harbor should also be expanded to accommodate recreational boating needs. The recommended expansion would provide an additional 550 new recreational and fishing boat slips. The depth of the entrance channel and the fish unloading areas should be increased from 15 to 20 feet to accommodate the larger, deep-draft fishing vessels and trawlers required for bottomfishing. In addition, either a significant parking area or a bus shuttle to an off-spit parking lot will be required.

Dredged material from the expansion of the small-boat harbor could be used as fill to build the initial phases of a 30-acre\* commercial port area immediately north of the boat harbor. The commercial port would offer four prime features:

1. A possible staging area for offshore oil drilling support
2. Additional space for fish unloading and processing
3. A modern facility for general cargo shipping and receiving in both containerized (roll-on/roll-off) and breakbulk form, and
4. Space for the development of port-related light industry, such as boat repair facilities, small boat sales, etc.

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\*Based on a common planning factor: 2 1/2 to 3 times the storage area for containers carried by ships serving the harbor (assumed to be a smaller container ship carrying 1000 20-foot containers).

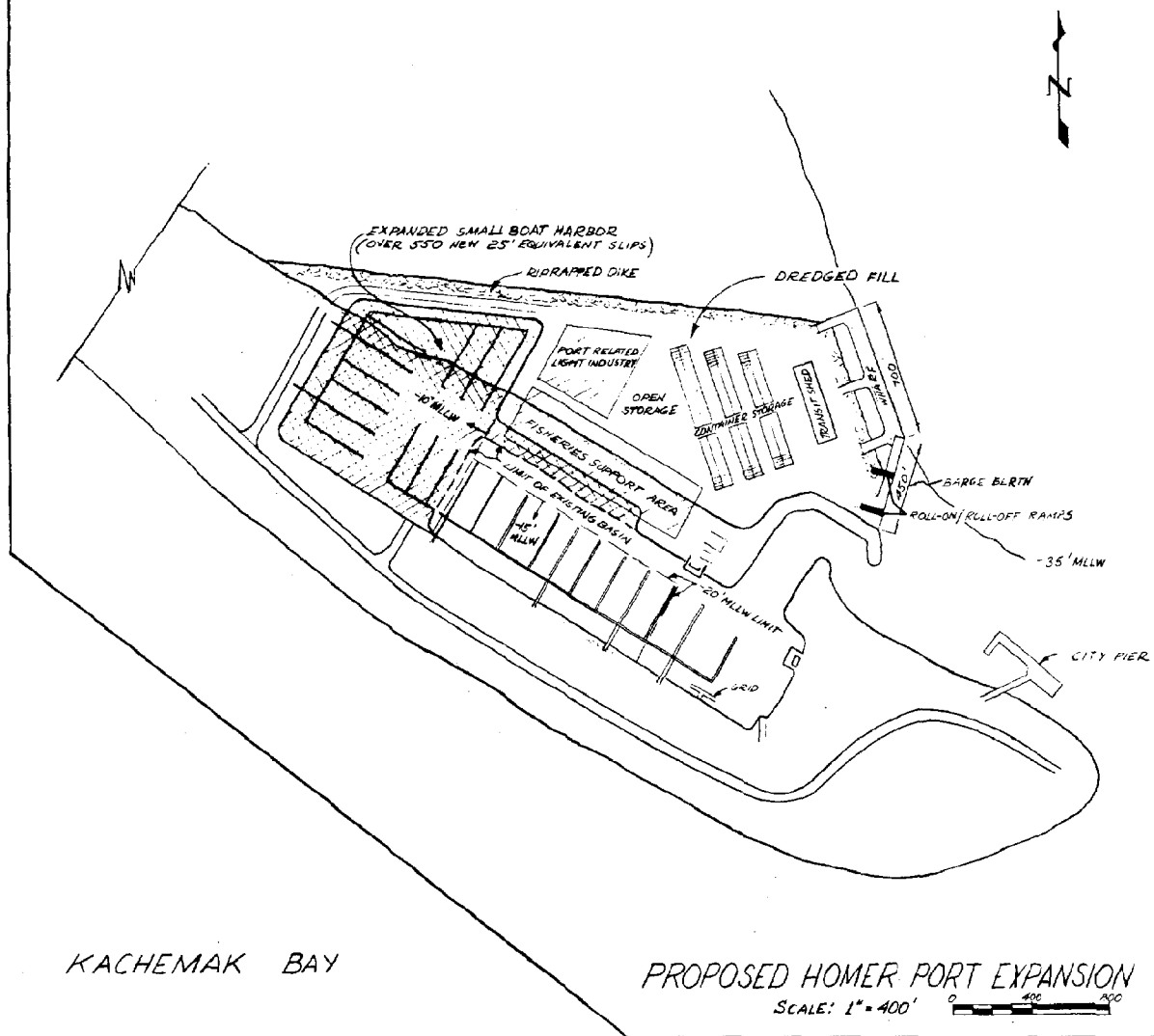


It may not be necessary to develop the entire 30 acres initially, but it is recommended that the entire dike be constructed so areas inside the dike can be developed as needs arise.

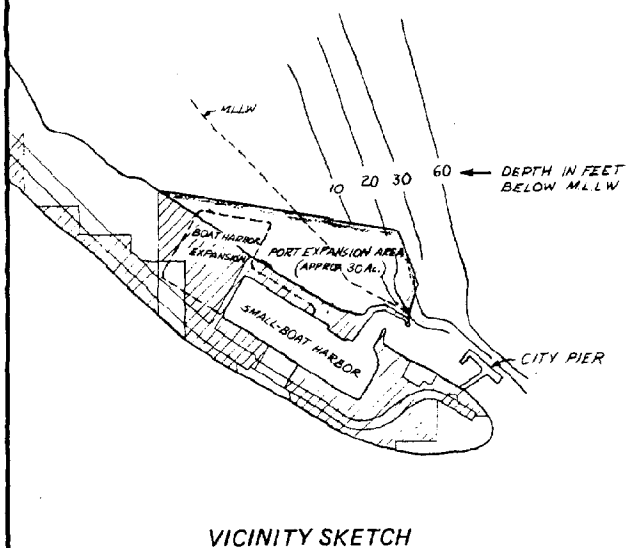
Due to growing transport requirements (60,000 tons in 1978--Table III--and 90,000 tons in 1990--Table III-5) and to its year-round, ice-free, sheltered location, Homer is a logical site for container feeder service to Anchorage, Kodiak and other ports. For the immediate future, a lift-on/lift-off type container facility (capable of handling about 500,000 to 1,000,000 tons per year) cannot be justified due to the large capital expenditure required and the low number of containers currently being shipped and received. However, a roll-on/roll-off facility with a 150,000 ton plus capacity could be feasible. It is therefore recommended that the roll-on/roll-off barge berth be developed, since the existing facilities will continue to be used for so many other purposes. This RO/RO facility could be followed by a 700-foot long lift-on/lift-off facility when economically justifiable. Note that the final design of those new facilities will be determined by the least-cost means of conforming with environmental restrictions regarding fills on the north side of the spit.

There is also an immediate need for the development of additional fish unloading facilities. An area has been reserved for this purpose on the north shore of the small-boat basin, along with on-shore space for additional fish processing facilities. However, the investment for such facilities is usually borne by private companies, and the city should lease the land for such purposes.

The existing city pier should continue to be used as a ferry terminal and a supply base for servicing existing offshore platforms. Provisions could also be made for unloading and transferring fish over this pier to processing plants on and off the spit.



PROPOSED HOMER PORT EXPANSION  
SCALE: 1" = 400'



VICINITY SKETCH

TOLERANCES (EXCEPT AS NOTED)	REVISIONS			SOROS ASSOCIATES		
	NO.	DATE	BY	HOMER HARBOR		
ORIGINAL	1					
1	2					
FRACTIONAL	3			DRAWN BY	V.K.	SCALE AS SHOWN
2	4			CHEK'D	DATE 8-14-79	MATERIAL
ANGULAR	5			TRACED	APP'D	DRAWING NO.
3						SK-2

Because there are no operational or cost-effective alternatives to this site in Homer, there was no site screening related to the proposals above. Similarly, alternative jurisdictional, land ownership, coastal-zone management, and environmental considerations were important but not overriding. Because of environmental restrictions, the concept plan in SK-2 has changed and will probably change again before all construction permits are obtained. In addition, sediment transport problems will have to be given special attention in the final design process.

#### HOMER HARBOR EXPANSION--COST ESTIMATE

##### SMALL-BOAT HARBOR EXPANSION

Dredging (including mobilization and demobilization of a dredge)	\$ 1,880,000
Filling/grading	2,200,000
Boat slips (including utilities)	<u>2,300,000</u>
Subtotal	6,380,000

##### COMMERCIAL PORT DEVELOPMENT

Breakwater/Dike	\$ 4,720,000
Filling and grading*	2,240,000
Barge berth with RO/RO ramp	2,150,000
Commercial wharf	5,760,000
Commercial boat slip improvements	1,036,000
Transit shed	2,400,000
Site utilities	<u>500,000</u>
Subtotal	\$18,806,000

Total	\$25,186,000
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\*Only one-half of this is scheduled for completion under the Business-as-Usual Strategy.

## KASILOF

### Existing Port Facilities

A small public pier, float, and a boat launching ramp are operated by the City of Soldotna close to the mouth of the river. The pier (the only public facility in the area) is used primarily for transferring fish into trucks to processing plants in the vicinity. A small truck-crane is parked on the pier for unloading fish. The water areas immediately offshore and upstream from the pier are popular anchorage areas for small fishing vessels, but the swift current makes anchorage difficult and boats have been known to break loose from their moorings and anchorages.

### Proposed Port Facilities

No major expansion of port facilities is recommended at Kasilof because no site-specific demands for port or harbor services are identified in Chapter II.\* However, it is important because it is the only public facility in the area and should be maintained as such. There are no major jurisdictional, coastal management, or environmental problems with the site, and ample level land is available for off-season, dry storage of boats if a crane of adequate size were available to lift the boats out of the water. Therefore, the existing pier should be repaired to ensure that the swift current does not further undercut the dock face; the boat ramp should be rehabilitated; and consideration should be given to purchasing a larger crane or boatlift.

#### KASILOF HARBOR UPGRADING--COST ESTIMATE

Dock strengthening	\$400,000
New boat lift	<u>\$200,000</u>
Total	\$600,000

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\*A more detailed study by the State Division of Harbor Design 2nd Construction is underway.

## KENAI/NIKISKI AREA

### Existing Port Facilities

The port facilities on the Kenai River and at Nikiski are numerous and have fundamentally different characteristics and functions, as shown by the following.

Kenai River. The users of the Kenai River facilities are predominantly commercial fishing vessels and some recreational boaters. Public facilities leased from the state are: 1) a launching ramp operated by the City of Kenai and 2) the City of Kenai dock, which is subleased to a commercial fish processing concern. The Kenai River has two characteristics that affect its use as a year-round port: 1) the controlling entrance depth is plus or minus one foot, and 2) ice pads during five or more months of the year.

Nikiski Area. The facilities at Nikiski consist of three specialized, private piers for loading LNG and petroleum products, and the private Rig Tenders dock for serving off-shore petroleum installations. The controlling depth at the piers is 40 feet or more and at the Rig Tenders Dock, -10 feet, M.L.L.W. Assuming its use for tug and barge operations, the capacity of Rig Tenders is estimated to be 100,000 to 150,000 tons annually. In the same area--Nikishka Bay--is a little-used "dock" consisting of three beached Liberty ships. No capacity is estimated for this facility.

### Proposed Port Facilities

There are two needs not being satisfied by existing facilities:

1. With the exception of Kasilof, there is no public facility in the Central Peninsula to serve commercial fishing boats for berthing, unloading and seasonal storage--all are private facilities. In addition, the Sustained Economic Development

Strategy for the Borough (discussed elsewhere in this report) has, as one of its elements, the expansion of salmon harvesting and processing. This implies an increase in both the size and number of vessels which will require port or harbor facilities.

2. There is no facility able to accommodate general cargo ships. While the low volume of general cargo makes it highly unlikely the Kenai River/Nikiski area would attract line-haul ships, regular barge feeder service might be induced if harbor depths were sufficient, 15 to 20 feet, and if shoreside facilities were available. See Table III-5, category "All Other" for general cargo projections.

General Cargo Facilities. In response to the general cargo needs, the Corps of Engineers evaluated the economic feasibility of making Kenai River a full tide port in 1976 and concluded that the estimated investment was not economically justifiable. Subsequently, private interests have indicated an interest in leasing city land on the Kenai River for use as a public boat harbor and storage area with related structures and facilities. This project is now believed to be inactive. Alternative cost estimates show Kenai River costs to be very high.

#### KENAI/NIKISKI GENERAL CARGO FEEDER VESSEL PORT

	COST ESTIMATE	
	Kenai River	Nikiski
Breakwater and dredging	\$45,000,000 <sup>1</sup>	\$ 9,200,000
Annual maintenance dredging	13,616,000 <sup>2</sup>	
General cargo dock (plus RO/RO ramp)	850,000	
RO/RO ramp only		350,000
Commercial fish dock	3,200,000	1,400,000
Fill, grading, slope protection		620,000
Total	\$62,666,000	\$11,600,000

<sup>1</sup>WCC projection based, in part, upon the Corps of Engineers estimate.

<sup>2</sup>Capitalized annual maintenance costs for 20 years based, in part, upon the Corps of Engineers estimates.

Regarding the alternatives for providing the least-cost RO/RO facility in the mid-peninsula area, costs would be as shown below, and the most serious questions about these concept designs have to do with possible littoral drift problems. No jurisdictional, environmental, or land ownership questions appear to be overriding.

NIKISKI AREA PORT DEVELOPMENT  
COST ESTIMATE

RIG TENDERS DOCK (initial construction)

Breakwater	\$ 8,000,000
Dredging (including mob./demob.)	1,200,000
Dock face extension and strengthening*	1,400,000
Filling and grading	650,000
Roll-on/Roll-off ramp	<u>350,000</u>
Total	\$11,600,000

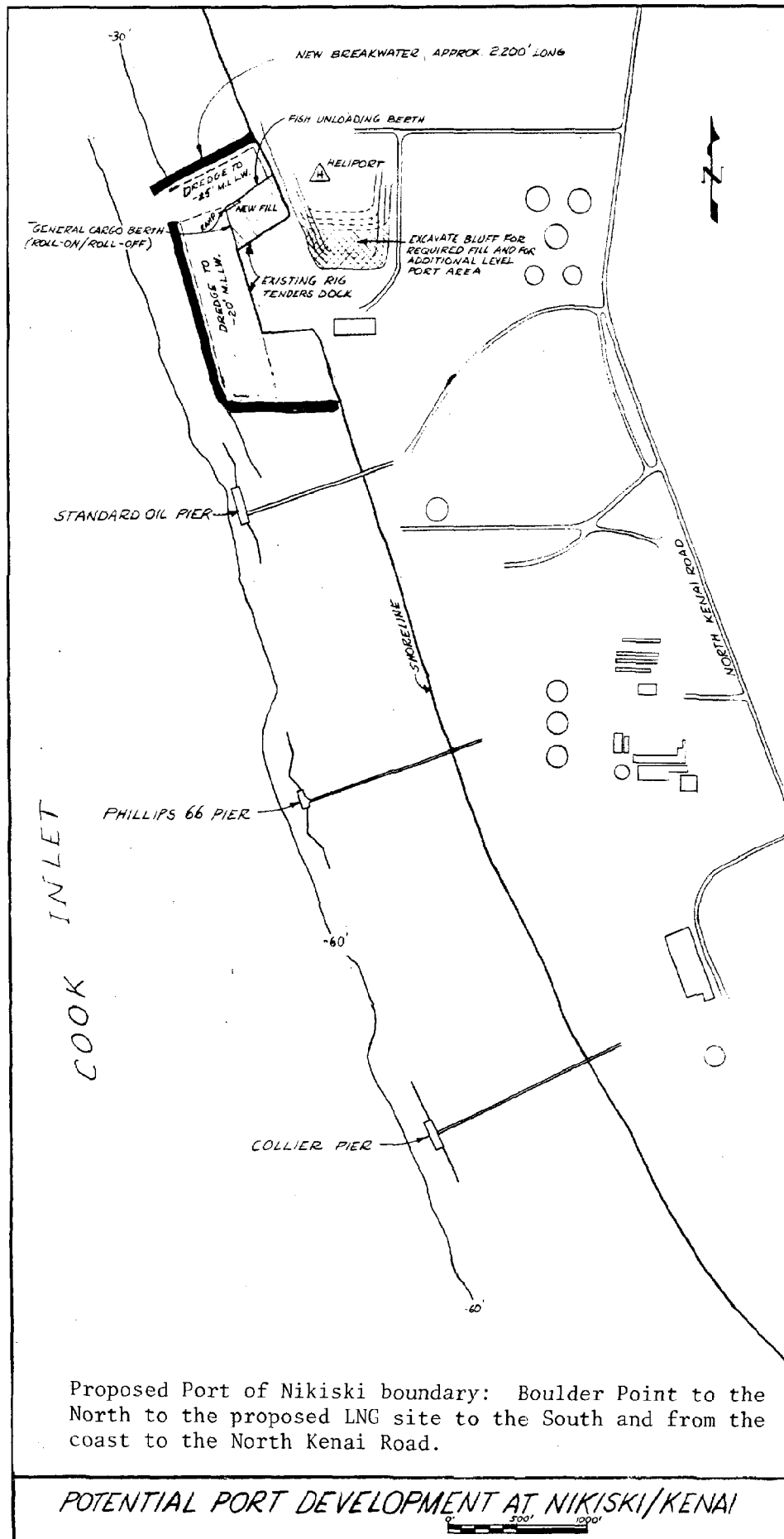
Future wharf	5,700,000
Future dredging	500,000
Future breakwater	4,500,000

NIKISHKA

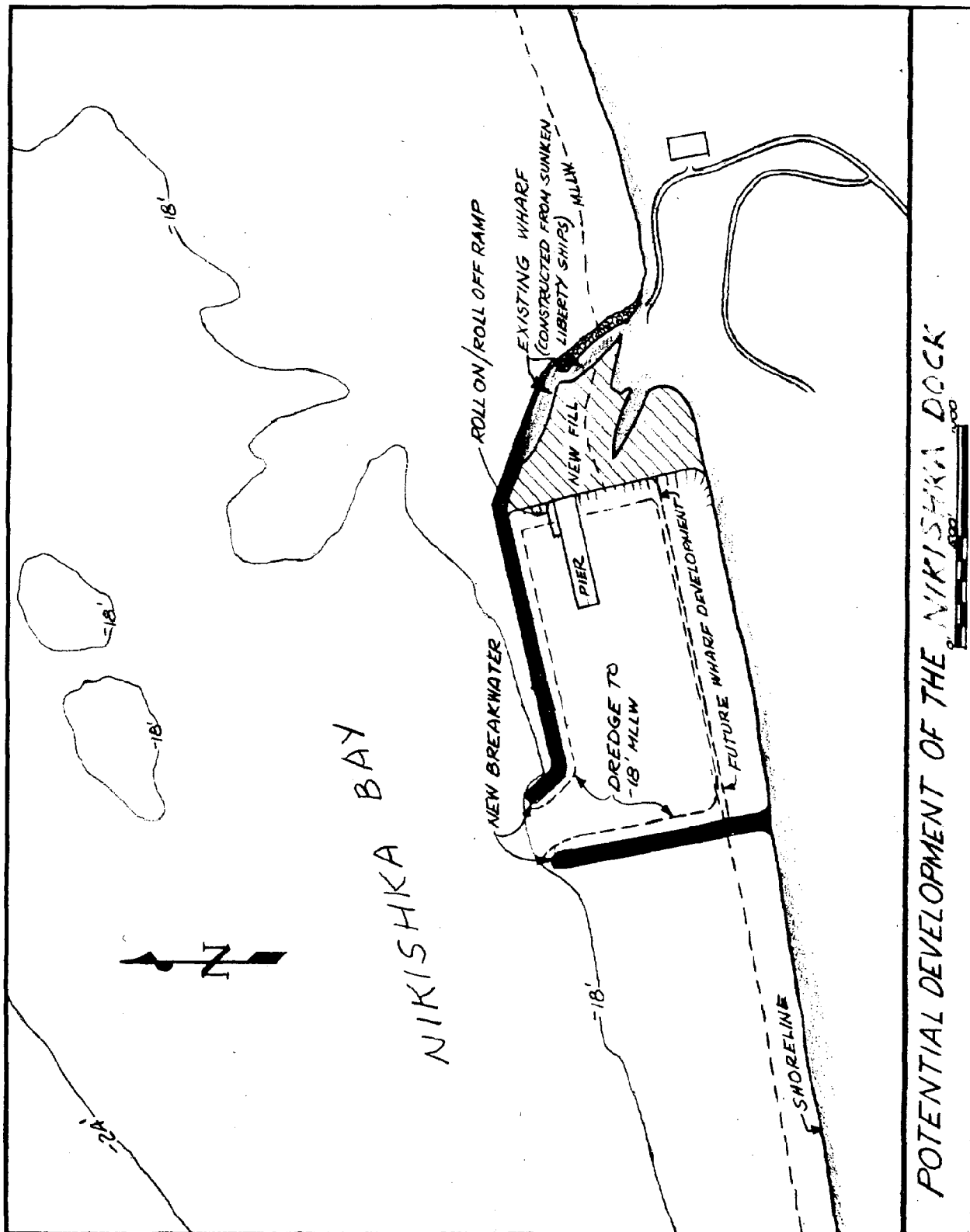
Breakwater	\$ 7,015,000
Dredging (including mob./demob.)	1,215,000
Fill, grading & slope protection	1,285,000
Pier (500 x 800 feet)	3,200,000
Roll-on/Roll-off ramp	<u>350,000</u>
Total	\$13,065,000

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\*The present dock face is designed for -10 feet at M.L.L.W. Dredging to -20 feet without strengthening the existing face will cause the bulkhead to fail.







Small Boat Harbor Facilities. Currently, the City of Kenai is expected to apply to the Corps of Engineers for a reevaluation of the 1976 feasibility study that would take into account more current information. The request is for a study which would not involve deepening of the river entrance but would provide about 400 slips, a storage area, and related facilities to serve commercial fishing boats and, to a limited extent, recreational boats. Based on a typical breakwater, float arrangement, the estimated cost of this proposed facility would be \$15 million.

The estimated \$15 million cost for providing the 400 slips on the Kenai River to serve fishing and recreational boats is assumed to be a reasonable order-of-magnitude estimate. However, information\* needed for economic/financial feasibility analyses of this proposal includes:

1. Surveys to determine the demand for this size of facility among both commercial and recreational boat operators;
2. Confirmation of the construction cost estimates and an identification of annual operating costs, taking into consideration the relatively short fishing/recreational season and river ice effects on the facility; and
3. An analysis of "benefits" likely to be derived from the construction of such a facility--including an identification of economic losses to current private dock operators due to the facility (this proposed facility might involve a significant shift of boat operations from their docks to the new public one and a shift of existing salmon harvesting "benefits" from the private to public docks, since potentially growing bottom-fish activities are not expected to affect the Kenai/Nikiski area).

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\*Beyond the scope of this project.

## NINILCHIK

### Existing Port Facilities

The Ninilchik small-boat harbor, located at the mouth of the Ninilchik River, is 400 feet long and 120 feet wide. Corps of Engineers project depth for the basin is +2 feet MLLW but a sill with an elevation of +9 feet at the harbor entrance maintains a minimum depth of seven feet in the basin at all times. The harbor is accessible to vessels approximately 25 percent of the time.

The harbor was designed to safely moor 32 vessels, but more than 100 boats have crowded into the basin at one time (during bad weather), creating a dangerous fire hazard. The harbor served as a commercial fish receiving port for the former processing plant adjacent to the harbor and for other plants on the peninsula which used trucks to pick up fish.

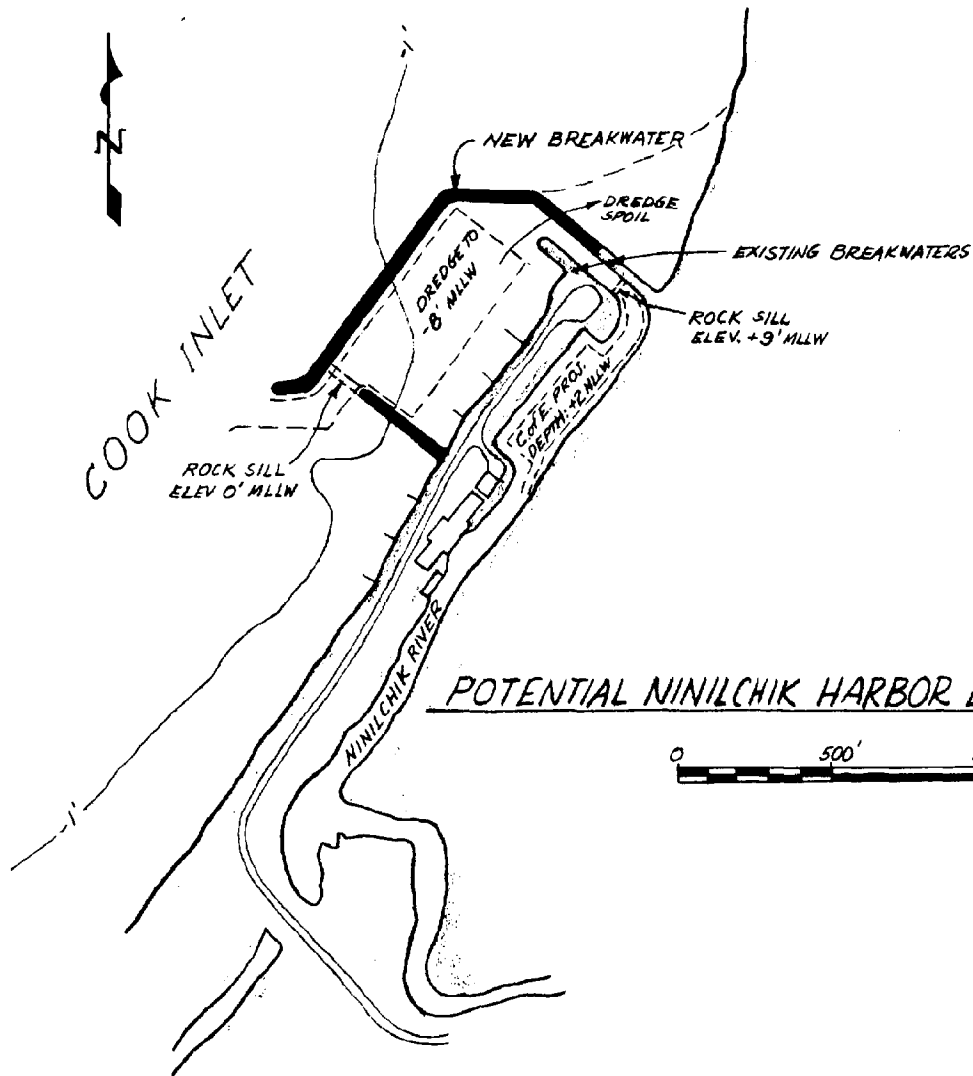
### Proposed Port Facilities

It is proposed that the Ninilchik harbor be expanded, as shown on drawing SK-3, to provide a harbor of refuge where vessels can anchor during stormy weather. The basin should be dredged to -8 feet MLLW and the sill elevation should be zero at MLLW, making the harbor accessible to vessels approximately 70 percent of the time. A caution for this project has to do with the lack of knowledge regarding the ability to dredge to -8 feet--the bottom could be mostly rock. Also, the entrance to this facility would be open to southwest winds in the summer.

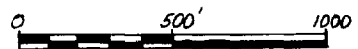
As the future need arises, a fish unloading pier could be constructed in the outer harbor, as well as additional berths for small boats.

#### NINILCHIK SMALL-BOAT HARBOR EXPANSION COST ESTIMATE

Breakwater	\$2,490,000
Dredging (including mob./demob.)	<u>580,000</u>
Total	\$3,070,000



POTENTIAL NINILCHIK HARBOR EXPANSION



TOLERANCES (EXCEPT AS NOTED)	REVISIONS			SOROS ASSOCIATES		
	NO.	DATE	BY	NINILCHIK HARBOR		
DECIMAL	1			DRAWN BY <i>V.K.</i>	SCALE <i>AS SHOWN</i>	MATERIAL
±	2					
FRACTIONAL	3			CHK'D	DATE <i>8-21-79</i>	DRAWING NO.
±	4					
ANGULAR	5			TRACED	APP'D	<i>SK-3</i>
±	6					

## PORT GRAHAM

### Existing Port Facilities

The main port facility at Port Graham is a private dock serving a fish cannery. About 50 commercial fishing boats are permanently based at the port and more than 100 additional vessels are docked here at the seasonal peak. In addition, Port Graham is frequently used as a harbor of refuge during bad weather.

### Proposed Port Facilities

The proposed facility for Port Graham would provide a broadwater-dock and small boat slips.

This facility would increase the number of active fishing vessels able to dock in the area, permit expansion of cannery activity at the port, allow additional fishing industry activities to develop, provide a harbor of refuge, and facilitate ferry and barge service to the port.

The features of the proposed facility would tentatively include approximately 100 berths for small boats and a dock for mooring larger vessels. The breakwater would provide a protected harbor for transient vessels during inclement weather, and permit barges and other large vessels to load or discharge cargo. Preliminary cost estimates are:

#### PORT GRAHAM HARBOR DEVELOPMENT

##### COST ESTIMATE

Breakwater	\$2,500,000
Boatslips	<u>230,000</u>
Total	\$2,730,000

## SELDOVIA

### Existing Port Facilities

Seldovia's harbor facilities consist of a small-boat harbor, a city pier, the Wakefield Seafood Pier and the deteriorating Anderson Dock. The city pier is L-shaped, with a 210-foot face, a deck height of 27 feet and a 16-foot water depth alongside. The Wakefield Seafood Pier is also an L-shaped pier with an 87-foot face and 6-foot depth alongside. The small-boat harbor is shielded by breakwaters and provides moorage for approximately 140 boats, with some transient space available. The Corps of Engineers project depth for the harbor and the entrance channel is -15 feet MLLW. A 106-foot-long boat repair grid and a boat launching ramp are also provided.

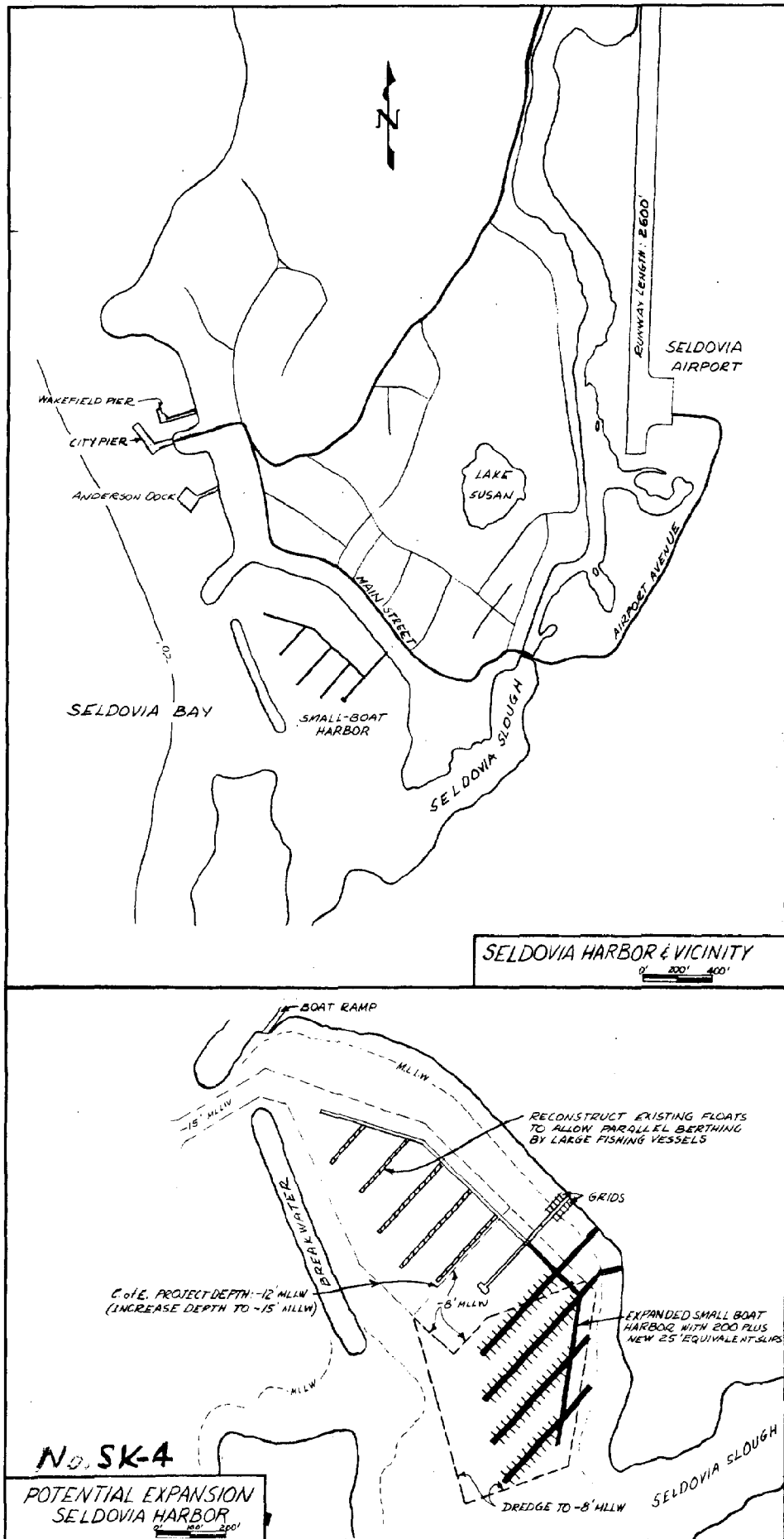
### Proposed Port Facilities

While Seldovia has been primarily a shellfish processing site, the demand analysis in Chapter II suggests bottomfish processing, tourism and offshore drilling support. The city pier is considered adequate for these purposes, so modifications needed are primarily for berthing the new larger crab boats and the future 130-foot bottomfish trawlers.

As shown on drawing SK-3, the recommended expansion consists of relocating the small-boat berths on the north end of the harbor to the shallower, southern end and reconstructing these floats to accommodate parallel berthing by the larger fishing vessels. The expanded boat harbor would provide up to an additional 240 small-boat berths in an 8-foot-deep basin and 1600 feet of parallel berthing space for the larger vessels in 15-foot water depth.

#### SELDOVIA SMALL-BOAT HARBOR EXPANSION COST ESTIMATE

Dredging (including mob./demob.)	\$ 660,000
New boat slips	880,000
Reconstruct existing slips	<u>200,000</u>
Total	\$1,740,000



## SEWARD

### Existing Port Facilities

The City of Seward, located at the north end of Resurrection Bay, is a natural, sheltered, deep-draft harbor with depths over 100 feet within a few hundred yards of the shoreline.

Existing port facilities include a deep-draft terminal, ferry terminal, small-boat harbor and a number of shallow-draft wharves. The Alaska Railroad owns and operates the deep-draft pier, which has 600 feet of berthing space on each side and a 200-foot outer face. The water depth at MLLW is 33 feet along the west side and 35 feet along the east side and the outer face. The deck height is 24 feet, and two 45-ton gantry cranes serve the east berth. Approximately 24,000 square feet of covered and heated storage is also available. Based on engineering through-put estimates, the capacity of this facility is probably between 1,000,000 and 1,500,000 tons per year. In contrast, Table III-1 indicated only a 90,000-ton throughput in 1977.

The ferry terminal, located at the south end of town, is a 190-foot wharf with a 39-foot water depth alongside. The deck height is 18 feet. The wharf is owned by the City and operated by the Alaska Marine Highway System.

A small-boat harbor, operated by the City, is located 1/4 mile west of the Alaska Railroad pier. It is protected by breakwaters, and the 120-foot-wide entrance channel is marked by lights. The Corps of Engineers project depth for the entrance channel is -15 feet MLLW and -12.5 feet inside the harbor. The basin has more than 500 berths but is overcrowded during the peak summer season. A launching ramp, boat repair grid, seaplane float and 40-ton boatlift are also provided in the harbor.



The city pier and Seward Fisheries wharf and a boatlift pier are located at the north end of the small-boat harbor. A total of approximately 1,000 feet of docking space is available for use by fishing vessels and other larger vessels. Deck heights are 18 feet. Assuming its use by a small 3000 DWT freighter, the general capacity of this facility would be 100,000 to 200,000 tons per year.

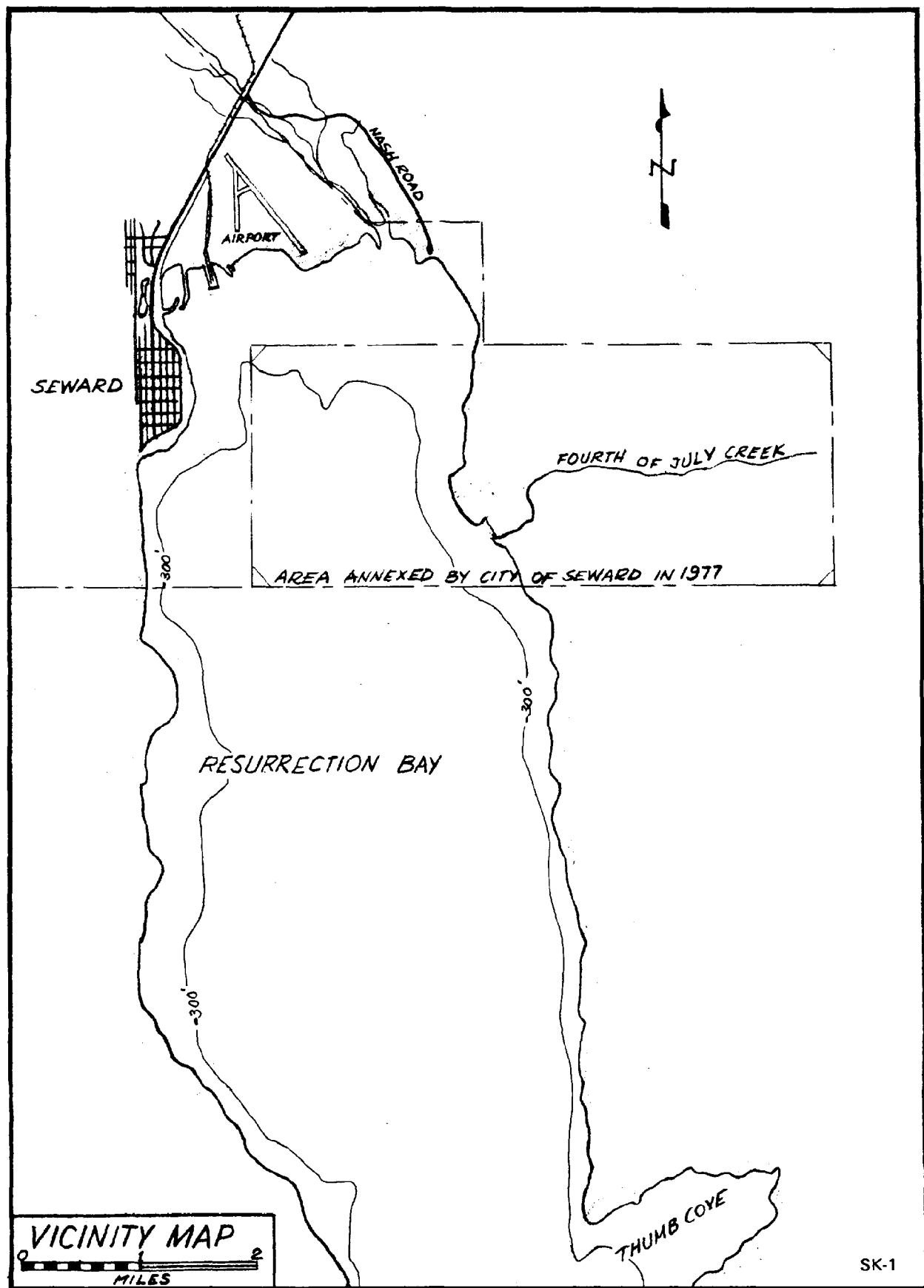
#### Proposed Port Facilities

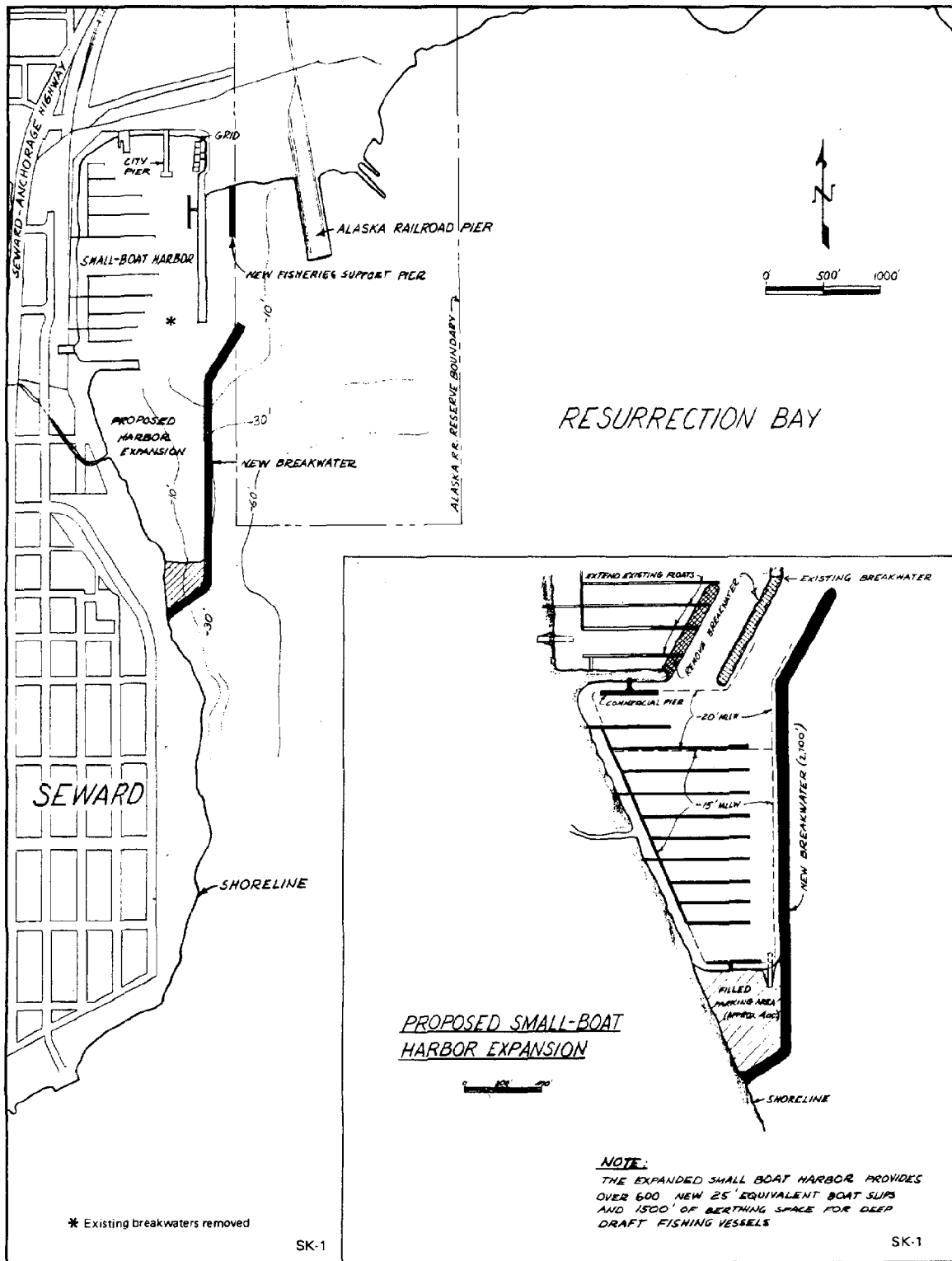
The proposed Seward port expansion is shown on drawing number SK-1. There is an immediate need for the expansion of the small-boat harbor to accommodate a standing need for 600\* additional berths for both recreational and small commercial fishing boats. Due to the proximity of very deep water along most of Seward's waterfront, the best available location for the expansion of the boat harbor is immediately south of the existing facility. Constructing fixed breakwaters in deep water is expensive, and floating breakwaters have yet to prove effective in areas of high tidal variations. Thus, it is recommended that the small-boat harbor expansion be limited in size to that which can be shielded by a breakwater constructed in no deeper than 30 feet of water, as shown on drawing SK-1. Over 600 new 25-foot equivalent boat slips, along with 1500 feet of deep-draft berthing space, can be provided by the new harbor configuration shown. The small creek, which empties into the new basin, may have to be rerouted to the south, since it leads to a popular fish spawning area and should not be blocked.

To relieve congestion at the city dock during peak commercial fishing season and to respond to bottomfish support needs, consideration should be given to building a new fisheries support pier outside the breakwater, adjacent to the Seward Fisheries processing plant. This

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\*The remaining 400 of the 1000 total new berths will presumably be provided at the Fourth-of-July Creek site.





facility could be used by larger vessels which find it difficult to maneuver in the congested harbor and which do not need a completely sheltered harbor under most weather conditions.

Neither the basin nor the pier would involve overriding jurisdictional, environmental, or coastal management issues.

Any further development of port facilities should be undertaken on the east side of Resurrection Bay. There is a potential marina site at the end of Nash Road, and the Fourth of July Creek area lends itself to all types of possible developments, especially those requiring a deep-draft port with water depth in excess of 60 feet. Such depth is available just 1000 feet offshore from the Fourth of July Creek area. Current proposals for this area include a joint City/private sector venture involving a shipbuilding and repair facility. The successful development of this project will result in road, water, power and sewer services to the area--services that could make the area attractive for future deepwater port development.

#### SEWARD HARBOR EXPANSION--COST ESTIMATE

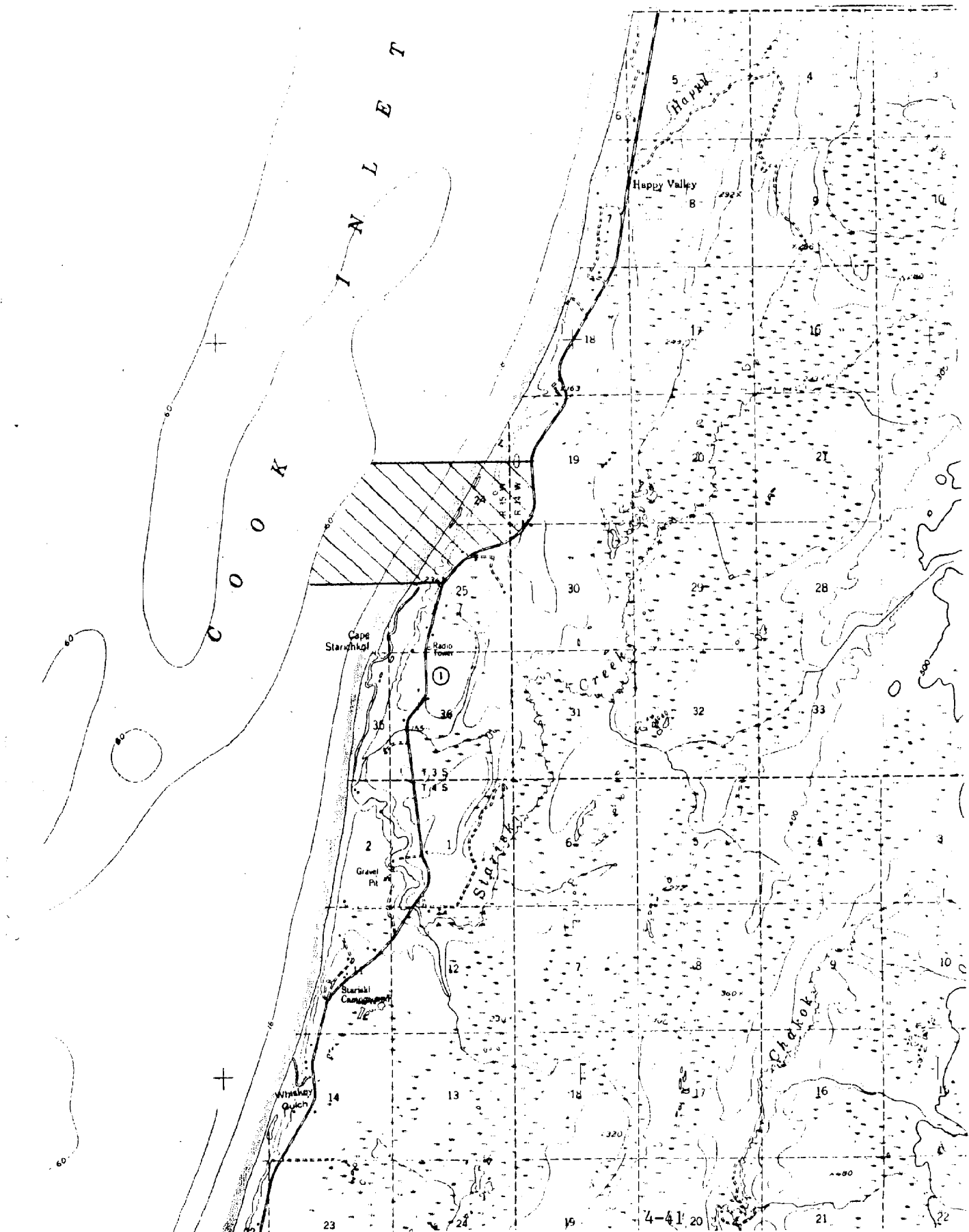
##### SMALL BOAT HARBOR EXPANSION

New breakwater	\$4,200,000
Existing breakwater removal	370,000
Dredging (including mob./demob.)	900,000
Filling and grading	360,000
Boat slips and access ramps	2,100,000
Commercial pier	600,000
Boat ramp	<u>60,000</u>
Total	\$8,590,000
FISHERIES SUPPORT PIER	\$ 960,000

#### CAPE STARICHKOF

The potential for deep-water port development is one of the prime criteria in the selection of a potential plant site by oil companies. Oil and oil products usually move in tankers requiring water depths of 60 feet or more. Therefore, the closer deep water lies to the shoreline, the less expensive a deep-water port will be.

The 60-foot depth contour lies generally 2.5 to 3 miles offshore along the lower peninsula, except for a three-mile stretch near Cape Starichkof, where it falls within 0.7 miles from the shoreline. This area therefore, has a high potential for offshore oil-related industrial development. It is, therefore, recommended that at least a mile-long stretch of land between the highway and the shoreline, along with submerged lands to the 60-foot depth contour, be zoned or otherwise reserved for such potential use. Suggested limits of such an area are shown on the following map.



CAPE STARICHKOF & VICINITY  
 Scale: 1" = 1 mile 4-25

## TYONEK/BELUGA COAL AREA

The Kodiak Lumber Company, controlled by Japanese interests, owns and operates a wood chip loading pier at Tyonek. However, due to the variable market for wood chips, this facility is periodically not in operation.

While no firm demands could be identified for this area, some contingency planning is warranted. For example, the woodchip facility could be converted to load coal at a very reasonable cost. Companies with mining rights at the adjacent Beluga coal deposits are considering this possibility. However, when the Beluga resource is developed for coal or conversion to methanol (and if the proposed 700 mining workers reside in the immediate vicinity), a general cargo dock will also be required to supply a total community size of about 4000 persons, as well as the mining operation itself (fuel, ports, explosives, etc.). In addition, the Beluga area could be the site of a cement plant which might require significant incoming bulk supplies, as well as packaged or bulk shipments of cement. Thus, in addition to the current timber pier, bulk coal, methanol, and cement facilities may be needed in the future. Since there could be so many different users, and since space would be limited, the Borough should monitor these potential developments very closely. Then, if developments take place, the Borough should also work closely with the appropriate companies to assure the type of development desired.

A boundary for a port in this area should be set up for contingency purposes. It should extend from 3000 to 5000 yards inland between Three Mile Creek to the north and Granite Point to the south.

## SUMMARY OF PORT IMPROVEMENT COSTS

Total port and harbor costs are identified above for the Sustained Development Strategy. However, it is necessary to separate: 1) those costs that will be expended in any event with no Borough involvement (i.e., under the Business-as-Usual Strategy), and 2) those costs that can be fairly attributed to Borough decisions. The latter are the only costs that can be used in the feasibility evaluations in the next report section.

The basis for cost assignments in Table IV-1 include evaluations of:

- 1) current plans, financing feasibility, acquired permits, etc., for port or harbor improvements either by one of the cities or by private investors, and
- 2) near-future plans, financing, and permitting possibilities, etc.

This is not an analytical or absolute process but one that is oriented toward assigning future improvement costs on as fair a basis as possible. The major concern in this effort is to avoid an over-assignment of costs to the Business-as-Usual Strategy since that assignment will distort and minimize costs being used in the feasibility analysis. Thus, assigning costs to the Sustained Development category when any doubt exists will represent a conservative approach to the feasibility analyses.

Table IV-1 shows that approximately two-thirds of the total costs, \$46 out of \$66 million, have been assigned to the Sustained Development Strategy (also see summaries in Appendix A). The priorities for these expenditures are discussed in the feasibility analysis section, where both costs and benefits can be considered. Given those priorities and



Table IV-1. ASSIGNMENT OF PORT IMPROVEMENT COSTS (\$000,000's)

Port*	Business-as-Usual Costs		Sustained Development Costs	
Cape Starichkof	None		Contingent on Oil/Gas Finds	
Homer	Industrial Park		RO/RO ramp	\$2.2
	Small boat Harbor	\$4.2	Wharf	5.8
	Filling/Grading	2.2	Shed/Utilities	2.9
			Fill/Grade	2.2
			Breakwater/Dike	4.7
Kasilof	None		Kock	0.4
			Lift	0.2
Kenai River	Small boat harbor	15.0	None	
Nikiski Area	Grid for the LNG		Dredging/Fill	1.9
	Construction Activity	0.5	Breakwater	8.0
			Dock & RO/RO	1.8
Ninilchik	None		Safe harbor	3.1
Port Graham	None		Breakwater/Slips	2.7
Seldovia	Dredging and boat slips recreational	1.2	Dredging Recon-struction (for larger fishing boats)	0.3
Seward	Fourth-of-July-Creek		Breakwater	4.6
	Ramp & Parking	0.3	Dredging	0.9
	@ Nash Road		Fill/Grade	0.4
			Slips/Ramps	2.2
			Comm. Piers	1.6
Tyonek	Private sector piers		Commercial dock	
	Coal	No	contingent on	No
	Cement	Est.	coal/cement	Est.
	Methanol		developments	
		\$20.5		\$46.9

\*Listed alphabetically -- not in a priority ranking.

\*\*Do not add because of rounding.

the financing options in the Action Plan, the Capital Improvement Program (CIP) was completed and is presented in the following feasibility section and in the Action Plan.

## SUMMARY OF PORT DEVELOPMENT CONSIDERATIONS

The consideration of various port development issues was severely limited by the scale of development demands and shipping activities. For example:

- Jackolof, Trading Bay, Redoubt, Tuxedni, Kamishak Bay, etc., were not investigated because of the lack of development demands in those areas that would be dependent on improved port services--in fact, so many sites were available to serve near-future demands that no new sites were needed except for contingency planning purposes
- shipping volumes at all ports are so low that a single, two-lane road for port access would be sufficient (recreational boating traffic is a serious problem at several harbors, but with its minimal benefits, close consideration should be given to road spending just to support this activity)
- since the proposed port facilities are minimally sized, only the size of calling ships is relevant; that is, their frequency of call is so low that ship traffic was not a consideration in the design of facilities (a safety concern exists at Ninilchik)
- commodity flow volumes are so low that common transport system analyses are not required--only rudimentary multi-model analyses could be performed, as shown below, and
- major considerations, with the relatively low demands/traffic volumes and the number of existing sites, are 1) to avoid the duplication of facilities and 2) the need to compete with ports outside the KPB for limited commodity movements.

Since no major new site developments are required, except on a contingency basis, the comparison or screening of sites is limited to that shown in Table IV-2. The basis for comparison is as follows.

Economic Development Demand. This evaluation is dependent on the identification of feasible, location-specific developments or cost saving opportunities. The "contingent" evaluation simply means that possible developments are dependent on other than economic criteria or simply cannot be predicted with confidence.

Alternative Sites. Most of the development discussed above in Section II is location-specific, that is, the development could be most cost-efficiently served by the subject port. Where alternatives were considered to exist, costs for further improvement at the subject port were extremely high.

Significantly New Services Required. These refer to either access by road or the usual municipal services, water, power, sewers, and fire and police protection, etc. Most of this information exists in other recent documents (1,2,3,4,5). Where deficiencies could be identified and where cost estimates existed for correcting deficiencies, those costs were included in the feasibility analysis.

Growth Potential. The qualitative evaluation of costs for improvements, beyond those proposed for the Sustained Development Strategy, is shown in Table IV-2. The object of this evaluation is to report on the information gained in preparing cost estimates for this project.

Table IV-2. FACILITY DEVELOPMENT CONSIDERATIONS

Port	Economic Development Demand	Alternative Sites	Significant New Services Required	Growth Potential	Physical; Jurisdictional; Environmental
Cape Starichkof	Contingent	No	Access road; all services	Expensive	None identified
Homer	Firm	No	Road/parking	Very expensive; conflicts exist	Fill and littoral drift
Kasilof	Limited by port const./ maint. costs	Yes	No	Extremely expensive	Shallow water; ice; silting; current
Kenai	Limited by port const./ maint. costs	Yes	No	Extremely expensive	Shallow water; ice; silting
Ninilchik	Firm	No	Improved road access	Expensive	ship traffic; silting; wind; traffic safety  Littoral drift; possible rock bottom
Port Graham	Firm	No	Road; water; power; sewer	Reasonable	Cemetery limits access
Seldovia	Firm	No	No	Reasonable	None
Seward	Firm	No	Only to Fourth- of-July Creek	Good at Fourth- of-July	Small creek diversion needed
Tyonek	Contingent	No	New community and all services	Not known	Possible ice

## OTHER TRANSPORT REQUIREMENTS/OPTIONS

Normally, before port improvements are scheduled in a capital improvement program (CIP), a transport systems analysis is conducted. The object of this analysis is to determine: 1) if the proposed port improvements are the least-cost alternatives, and 2) if feasible, whether or not the port improvements will require related road, rail, or pipeline improvements. However, for this project, commodity flow volumes were so low that a systems analysis was not possible except on a rudimentary basis. Thus, the following presents a mode-by-mode evaluation related to the port improvements proposed above.

Pipelines. Historically, pipelines have been a single-purpose mode and so closely associated with private developments that any Borough involvement would be of an advisory or permitting nature. Options for pipeline development are restricted to the gas-liquids petrochemical plant, the coal-to-methanol conversion that might use the Draft River facility, and the Lower Cook Inlet oil/gas potentials. No further commodity-mode shifts, like the Nikiski-Anchorage line, were identified.

Railroads. Proposals for rail extensions into the Kenai area have been made (6), but only on the basis of incomplete analyses. Planning factors for meter-gage rail operations in the developing countries (7) suggest that a minimum of 500,000 tons in each direction are required for feasibility. Since KPB commodity flows are only 20 percent of this requirement, and since Alaska construction/operation costs are known to be somewhat higher than those in current cost models, no further consideration was given to new rail projects. However, the effects of a possible abandonment of the Seward line, due to low traffic volumes, were considered. This consideration was halted when it was learned that a statewide study was being initiated in early 1980 (8) to investigate new line requirements as well as abandonments.

Air Cargo. It was suggested by the Kenai Port and Harbor Committee that the cost of air freighting general cargo into the KPB might be cheaper than the present methods. Presumably, this would apply to the 93,000 tons of in-bound and 79,000 tons of out-bound general cargo only. Given the capacity of current aircraft, this would require about three aircraft trips per day in and out of the KPB. Despite the obvious attractiveness of such an operation, a number of factors would be taken into account before any private carriers proposed such a service. They have to do with commodity volumes and values, market structures, origin-destination factors, and physical facilities.

Regarding commodity values and volumes, it can be pointed out that air cargo is the most expensive of all the modes of transportation. While high-value commodities can absorb the high rates, low-value commodities cannot, and the fuel situation is causing significantly higher rates.

As an example of the portion of local general cargo that is subject to carriage by air, only 6000 of the 2.5 million general cargo tons, or 0.2 percent, was carried in and out of Anchorage by the largest carrier in 1978 (9). National percentages are higher and, before the fuel crisis, were growing rapidly.

Second, for carriage, all the cargo would have to be collected at and distributed from a single point, the Kenai airport. However, the origin-destination analyses for this project showed general cargo arriving from numerous west coast and Asian origins. Further, market structures would make it extremely costly to collect all of the air tonnage in a single airport such as Seattle.

Finally, not only would the KPB have to build airport/communication facilities comparable to those in Anchorage before they could compete for the traffic, but they would have to continue to compete with Anchorage after an investment of billions of dollars. On this basis, it does not appear financially attractive for the KPB to compete with Anchorage for the airborne traffic destined for or originating in the KPB. (This is the same problem that exists with direct ocean shipments in and out of the KPB--the basic difference being that the costs and risks are probably orders of magnitude higher.)

Finally, 1) no impacts on port planning are expected as a result of the seasonal, direct Seattle-Kenai air service initiated in 1979; 2) sea-plane berthing requirements were found to be so small as to have no major effects on port and harbor designs; and 3) the shortage of ramp space at the Kenai airport was deemed a more costly solution to Bristol Bay fish fly-in problems than rerouting part of that traffic to the Soldotna airport.

Road. Numerous KPB shippers complained about the expensive road service to Anchorage. Estimates for single container costs to Seattle ranged as high as \$1000 from Kenai to \$1500 from Homer. Anticipating that feeder roll-on/roll-off (RO/RO) barge service from Kenai and Homer might be less expensive, specific rates were requested from Sea-Land, Crowley Maritime, and from Tote.

Using the response from Sea-Land (10) regarding rates for household goods and food stuffs from Seattle to Kenai via ship, potential savings for containers carrying 13,600 pounds to Anchorage and then via RO/RO barge (instead of truck) to Kenai, were found to be as follows:



#### Inbound Costs

Household goods:  $10.32 - 8.60 = \$1.71/\text{cwt}^*$   
Food stuffs:  $6.20 - 5.83 = 0.37/\text{cwt}$   
Avg. savings:  $\frac{1.71 + 0.37}{2} = 1.04/\text{cwt}$  or  $\$20.80/\text{ton}$

#### Outbound Costs

Fish:  $4.09 - 3.32 = \$0.77/\text{cwt}$  or  $\$15.40/\text{ton}$

Based on the total 1977 general cargo movements (57,000 tons inbound and 48,000 tons outbound -- see Table III-5 and exclude Seward) these savings would amount to:

$57,000 \text{ tons} \times \$20.80/\text{ton} = \$1,190,000$   
 $48,000 \text{ tons} \times \$15.40/\text{ton} = 740,000$   
Approximate Total =  $\$2,000,000$

Under the Sustained Development Strategy, these same savings in 1990 (see Table III-5 and exclude Seward) would amount to:

$93,000 \text{ tons} \times \$20.80/\text{ton} = \$1,930,000$   
 $118,000 \text{ tons} \times \$15.40/\text{ton} = 1,820,000$   
Approximate Total =  $\$3,700,000$

Note that these calculations are based on total general cargo movements in and out of the Peninsula (excluding Seward). They are gross approximations only, since, due to the lack of actual commodity shipment data, it is impossible to calculate actual savings on an individual commodity basis. Furthermore, not all general cargo commodities could fit this

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\*cwt is the designation for 100-pound increments

shipping pattern. Therefore, for purposes of the feasibility analyses below, 50 percent of these savings are estimated to be possible with a RO/RO charge substitution for the current Kenai-Anchorage truck operations. This \$1,800,000\* savings would accrue to Kenai shippers only if the RO/RO is a success, and only if the potential savings are aggressively pursued. Starting in 1982, the operation would involve the equivalent of about 10,000 containers per year, or about 200 containers per week. By 1990, shipments might reach the equivalent of 250 containers per week.

State Ferry Requirements. While provisions for the state ferry at Seward, Homer, Seldovia and Port Graham are discussed above, a lack of planning data and firm service-extension plans prevented a more detailed handling of this subject.

The costs for the minimum facilities and cost savings from the system analysis are carried into the feasibility analysis of Chapter V, which follows.

In summary, the economy of the Borough and its transport system is at such an early stage of development, future growth potentials are so location-specific and detailed movement data are so limited that:

- the analysis of alternative routes and modes are severely restricted, and
- the road-to-RO/RO barge appears to be the only mode-shift for which even rough estimates can be made.

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\*Similar calculations for the Accelerated Growth Strategy revealed tonnages and savings about 50 percent higher, or \$2,700,000 per year.

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FEASIBILITY AND BENEFIT ANALYSES

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The economic benefits from projects undertaken in the Sustained Development Strategy exceed the estimated costs for these projects by a ratio of 1:1.3. This 30-percent margin of benefits over costs is considered small and implies that an aggressive and systematic development program will be required to accomplish the projected growth.

Most of the port investments under the Sustained Economic Development Strategy are for joint-purpose, general cargo facilities, rather than single-purpose facilities. Because of the potentially high proportion of shared costs (see the finance section of the Action Plan), it is not realistic to compute separate benefit-cost ratios for each project. Thus, the following feasibility analysis is analyzed in terms of total benefits and total costs and is concerned only with investments and benefits under the Sustained Economic Development Strategy.

## COSTS

Project costs, in constant 1979 dollars, were summarized earlier in Table IV-1. These are total costs which must be "staged" to reflect considerations such as construction sequences, the potential availability of financing, progress that has been made to date in the planning/permitting process, and special opportunities or priorities. Most important, this overall scheduling of costs is totally dependent on the Borough's assumption of port powers so it can assist with planning and

financing the improvements (see Chapter III of the Action Plan for financing options, Chapter II of the Action Plan for organizational requirements, and the "Benefits" discussion below for a priority ranking of economic activities and related port requirements).

The staging of project costs shown in Table V-1, was organized taking all the above factors into consideration. Thus, it shows an immediate initiation of projects in Homer, Nikiski, and Seward followed in close order by those at the rest of the ports. Presented in Table V-1 are staged costs for the next five years, with some related improvements in the second five years. Because improvements in the second five-year period are not as urgent as those in the first, it will be necessary to confirm their final scheduling in an on-going, planning-evaluation program.

Of the total costs, about two-thirds are for dredging and breakwaters and about one-third for facilities such as docks, RO/RO ramps, and fish unloading and tourist facilities. Since the Corps of Engineers is frequently involved in the financing and permitting of breakwaters and dredging, it is critical that the Borough coordinate this programming with the Corps as soon as it has assumed port powers. Similarly, the state is becoming increasingly involved in harbor facility financing. Thus, this Capital Improvement Program (CIP) should also be coordinated with the State Division of Harbor Design and Construction and, if necessary, revised to reflect its programming schedule. Following programming coordination with all concerned state and federal agencies, the CIP shown in Table V-1 should be revised.

#### BENEFITS

The implementation of the Capital Improvement Program (CIP) (Table V-1) would result in reduced transport costs and increased wages and

Table V-1. CAPITAL IMPROVEMENT PROGRAM (CIP)  
SUSTAINED ECONOMIC DEVELOPMENT STRATEGY<sup>(1)</sup>  
(Thousands of 1979 Constant Dollars)

Port	Project Feature	Year of Construction									
		1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
Kasilof											
	Dock improvements			\$ 400							
	Boat lift			200							
Ninilchik											
	Breakwater/dredging		\$3,070								
Seldovia <sup>(2)</sup>											
	Dredging			330							
	Comm. boat slips			200							
Homer <sup>(2,5)</sup>											
	Breakwater/dike	\$4,720									
	Filling/grading		2,240								
	Roll-on/roll-off berth			2,150							
	Comm. boat slips			518						\$ 518	
	Commercial wharf								\$5,760		
	Transit shed/ utilities								2,900		
Seward <sup>(2,3)</sup>											
	Breakwaters	4,570									
	Dredging		900								
	Filling/grading		360								
	Slips and ramp			2,160							
	Commercial pier				\$ 600						
	Fish support facility				960						
Tyonek											
	Contingency planning only.										
Nikiski Area <sup>(4)</sup>											
	Breakwater	8,000									
	Dredging		900						\$ 300		
	Dock extension			1,400							
	Fill			650							
	RO/RO ramp			350							
Port Graham											
	Breakwater/slips		2,730								
Total Costs by Year <sup>(6)</sup>		\$17,290	\$10,730	\$7,828	\$1,560			\$ 300	\$8,660	\$ 518	

Notes:

- (1) Projects presented here are those deemed feasible based on available data.
- (2) Borough involvement in projects inside cities is possible only upon mutual agreement between city and Borough.
- (3) Does not include the joint Seward-private sector plans to develop Fourth of July Creek. This project is considered part of the Business as Usual strategy and is expected in addition to the projects listed in this table.
- (4) Does not include private projects such as the Kenai River small boat harbor.
- (5) Does not include Homer Fisheries Industrial Park.
- (6) Total costs are shown. They may be distributed between state, federal, and Borough depending on the financing strategy for each project.



profits from fishing, tourism, small support businesses, and recreational boating. A summary of these benefits, addressed in Chapters II and IV, is shown in the following table.

Table V-2. ECONOMIC BENEFITS IN 1990

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<u>Economic Subsector</u>	<u>Annual Benefits in 1990</u>
Transport system improvements	\$1,800,000 Reduced transport costs
Bottomfish harvesting	800,000 Wages and profits
Bottomfish processing	1,500,000 Wages and profits
Tourism	900,000 Wages and profits
Fish and tourism support business	300,000 Wages and profits
Recreational boating	90,000 Wages and profits

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Table V-2, identifies the benefits to the Borough, and of the priority of related port-improvement projects. Thus, the RO/RO ramps at Homer and Nikiski are high-priority projects in terms of their potential related benefits.

Bottomfish processing is the second largest potential benefit to the Borough, indicating a need to compete effectively with Kodiak, Cordova, etc., for bottomfish processing activities. Resource location considerations and making the most effective use of the Borough's human and physical resources,\* indicate that these activities should be promoted for Seward, Port Graham, Seldovia, and Homer.

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\*Centralization of bottomfish processing in a single KPB community and port is felt to be: 1) unnecessary to capture the maximum benefits, and 2) potentially damaging to the future growth or stability of small communities such as Port Graham or Seldovia.

A multiplier was used to estimate the benefits related to new recreational boating, tourism, fishing activities, etc. Since the use of multipliers is not a particularly good projection technique, and since KPB data do not exist to support a firm, analytical development of multipliers, the approach was used with caution. Recent work for the KPB coastal management program (1) and by the University of Alaska (2) reviewed the difficulties in this effort and led to the selection of a conservative 0.15 multiplier for the fish and tourist activities and the \$300,000 estimate shown in Table V-2.

The cost of constructing facilities in the KPB will also have related benefits to the construction workers and to local suppliers of materials for the projects. Thus, an estimate of 30 percent of the total construction cost is included in the feasibility analysis to account for local KPB wages and profits. This is considered to be conservative, since the labor component alone is normally about 60 percent of the total contract cost for similar projects.

Finally, these benefits in 1990 are used to "schedule" annual benefits over the 1980-2000 period for the feasibility analysis. Since benefits resulting from Borough actions could not be anticipated prior to 1982, that year was used as the base or zero-benefit year. See Table V-3 for a summary of the constant dollar costs shown earlier in Table V-1, and projected of benefits shown earlier in Table V-2, used for the preliminary feasibility analyses. These analyses are considered preliminary because the cost estimating and scheduling described above is subject to change as soon as the Borough successfully assumes port powers and reaches final agreements with the cities regarding cooperative actions. Following that action, it will be possible to update and reschedule costs and to develop an updated schedule of benefits.

Table V-3. COST AND BENEFIT SCHEDULE--SUSTAINED DEVELOPMENT STRATEGY  
(000,000's of 1979 constant dollars)

	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
<u>Construction Costs*</u> See Table V-1	17.3	10.7	7.8	1.6	-	-	0.3	8.7	-	-
<u>Benefits*</u> Transport Cost Savings	-	-	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8
Bottomfish Harvesting	-	-	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8
Bottomfish Processing	-	-	0.2	0.5	0.5	0.9	1.2	1.2	1.4	1.5
Tourism	-	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
Support Businesses	-	-	0.1	0.1	0.2	0.2	0.3	0.3	0.3	0.3
Recreational Boating	-	-	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Construction Benefits	<u>5.3</u>	<u>2.0</u>	<u>2.3</u>	<u>0.5</u>	<u>-</u>	<u>-</u>	<u>0.1</u>	<u>2.5</u>	<u>-</u>	<u>0.2</u>
Subtotal	5.3	2.1	4.8	3.5	3.3	3.7	4.6	7.2	5.1	5.6

\*Numbers rounded for presentation purposes.

(continued)

	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
-	-	-	-	-	-	-	-	-	-	-
1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8
0.8	0.9	0.9	1.0	1.0	1.0	1.1	1.1	1.1	1.1	1.2
1.5	1.5	1.7	2.0	2.0	2.0	2.2	2.5	2.5	2.5	2.5
1.0	1.0	1.2	1.3	1.3	1.5	1.6	1.6	1.7	1.7	1.8
0.5	0.5	0.6	0.6	0.6	0.6	0.7	0.7	0.8	0.8	0.8
0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>
5.7	5.8	6.4	6.9	6.9	7.2	7.6	8.0	8.1	8.1	8.3

## FEASIBILITY ANALYSIS

The feasibility of the proposed CIP was analyzed using the cost and benefit streams shown in Table V-3 and standard procedures and practices for such analyses (5). An interest rate of 10 percent was used to reflect the long term (to the year 2000) of the analysis, and no differential between inflation rates for benefits versus costs was anticipated.

The results of the feasibility analysis show the present worth of costs equal to \$32,875,000 and the present worth of benefits equal to \$42,962,000. Thus, the program of improvements is considered to be economically attractive. However, each project will need to be assessed individually as soon as more detailed project designs and costs are completed.

As indicated above, only preliminary costs were identified for the feasibility analysis. Since these costs were considered to represent a significant uncertainty, sensitivity analyses were conducted to determine if the feasibility of the port projects could be affected by possible errors in the cost estimates. The results of these analyses follow.\*

First, a 30 percent increase in total costs was projected, with the result that the present worth of construction costs increased to \$42,650,000. Since these costs are slightly below the present worth of benefits, the program would remain marginally attractive.

Second, as noted above, breakwater and dredging represent two-thirds of the project costs--costs which are frequently financed by the U.S. Corps of Engineers. Similarly, the state has both old and new port financing programs. Because of account these financing options, the

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\*The benefit estimates were not subjected to a sensitivity analysis because each was estimated and scheduled in a conservative manner.

feasibility of the program is relatively insensitive to any escalation in costs that would have to be borne by the Borough. For a detailed review of these financing options, see Chapter III of the Action Plan (3). That analysis indicates that financing options exist to the extent that the financial feasibility of the program is not a major consideration. As individual projects are undertaken, however, this financial feasibility will have to be confirmed.

#### SUMMARY

A number of benefits and considerations can be summarized to support the economic feasibility analysis above. They are new employment from Chapter II, transport mode shift employment from Chapter III, land use considerations from Chapter IV and physical, jurisdictional, or environmental cautions encountered during the course of the project. These subjects are presented in Table V-4, and discussed briefly below.

Employment and Wages. Direct employment from (Chapters II and III) and indirect employment (discussed earlier in this chapter) includes that by 1990 for bottomfish harvesting and processing, tourism and recreation, and jobs related to the shift of Kenai-Anchorage general cargo movements from trucking to RO/RO barge operations. Wages were based on broad industry standards and statistics in the KPB report on the 1980 economic situation and prospects (4). Since there is no analytical way of assigning such program benefits to specific sites, the data shown in Table V-4 represent a qualitative assignment. These assignments are based on the earlier location of specific activities, general cargo activities at Nikiski, bottomfish processing plants at Seward and Homer, most of the tourist activities in the southern areas of the peninsula, etc. Importantly, this employment and wage summary is only the port-related portion of the total employment and wage growth that will occur by 1990.

Table V-4. SUMMARY OF SITE CONSIDERATIONS

	<u>Employment</u>			<u>Wages (\$000's)</u>			<u>Land Use Considerations</u>		
	Fishing	Tourism/ Recreation	Support/ Transport	Fishing	Tourism	Other	Acreage Reqt.s.	Road Access	Activity Conflicts
Homer	50	30	55	\$1100	\$500	\$900	50	Restricted	Yes
Kasilof	NA	NA	NA	-	-	-	NA	Limited	No
Nikiski	5	-	30	100	-	600	30	Restricted	No
Ninilchik	NA	NA	NA	-	-	-	6	Limited	No
Port. Graham	10	5	5	100	100	100	4	Restricted	No
Seldovia	10	5	5	200	100	100	8	Good	Yes
Seward	40	30	20	\$800	\$300	\$500	25	Good	No

Land use considerations include the total onshore and offshore areas required for the projects, an identification of access characteristics and possible activity conflicts. The reader should refer to Chapter IV and Appendix A for details. Also, regarding access, the limited evaluation is intended to convey both need and physical characteristics. For example, while access to Kasilof is an improved but not paved road, the need for a higher standard facility probably will not exist before 1990. On the other hand, a restricted evaluation indicates that a need for improved access exists and that physical problems, such as the Homer spit road, require a solution now or by 1990.

Other considerations include those presented earlier in Table IV-2 having to do with physical restrictions, jurisdictional and environmental considerations. Because most of the improvements needed by 1990 are already developed or existing ports, these issues were not found to be overriding considerations.

Finally, this report must be used in conjunction with the Action Plan report since it includes related organizational and financing sections. The Summary document, then, incorporates essential elements of both the Action Plan and this Master Plan.

#### REFERENCES

1. Economic Projections for the Kenai Peninsula Borough 1978-1992, prepared for the Kenai Peninsula Borough Planning Department, March 1979
2. Southcentral Alaska's Economy and Population 1965-2025, prepared for the Alaska Water Study Committee by the University of Alaska, Feb. 1979
3. Action Plan - Port and Harbor Demand and Feasibility Project, prepared for the Kenai Peninsula Borough, by Woodward-Clyde Consultants and Soros Associates, April 1980
4. Situation and Prospects, Kenai Peninsula Borough, January, 1980
5. Harral, Clell G., Preparation and Appraisal of Transport Projects, The Brookings Institution, Washington D.C., October 1965



APPENDIX A

HISTORIC GOALS AND DEVELOPMENT STRATEGIES

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This appendix presents historic goals and the description/evaluation of alternative development strategies. The historic goals are presented in support of the present goals discussed earlier in the Introduction of this report. The alternative strategies were designed to reflect combinations of the past plus present goals and the development options presented in Section II.

Information on goals and attitudes was available from three general sources: 1) documents and reports available from government and private sources; 2) discussions with Borough, City, Native Corporation, and industry personnel; and 3) responses from public workshops and interim report reviews. At first, project goals were general in nature, relating to economic growth, population growth, infrastructure, and government's role in development. As the project progressed and the implications of the alternative development options became clear, some goals changed to focus specifically on the type of growth and port and harbor developments desired in the Borough.

#### HISTORIC GOALS

Preliminary or historic goals were selected from the following sources:

- Overall Economic Development Plan June 1978, Kenai Peninsula Borough, Overall Economic Development Committee, 1978.

- A Profile of Five Kenai Peninsula Towns: An analysis of the Demographic Characteristics and Attitudes Toward Services and Community Development in Kenai, Soldotna, Seward, Seldovia, and Homer, Anchorage Urban Observatory, 1977
- Annual Report on the State of the Borough-1977, Kenai Peninsula Borough
- OCS Development: A Headache or Blessing? The Choice is Kenai's, Kenai Peninsula Borough, 1977 (Also prepared for Homer, Seward and Seldovia.)
- Report to City Council, Prepared by the City of Seward Ad Hoc Committee, January 1979
- Public Opinion Regarding Petrochemical Refining Facility in the Central Kenai Peninsula Borough Region, Dittman Research Associates, 1978-1979
- Interviews: Cities of Kenai, Soldotna, Homer, Seward; the Kenai Peninsula Borough; and Cook Inlet Region, Inc. and Chugach Natives, Inc.

Since many of these publications are several years old, some goals and attitudes have changed. This was particularly true where the effect of OCS exploration failed to materialize, where construction employment decreased as the Alyeska pipeline was completed, and where petrochemical plant expansions and construction projects were completed or failed to materialize.

The preliminary goals that were identified fell into three major categories that could be used for designing alternative strategies: economic growth, social concerns, and government's role in development.

Several important subcategories were also identified, and as anticipated, conflicting goals were found among the reports. However, many of the conflicts were resolved as the implications of pursuing specific goals were clarified during public meetings and interim report reviews.

#### Economic Goals

Goals concerning economic growth included specific sector development preferences, transportation system development, employment opportunities, economic development planning (including promotion and financial assistance) and business climate.

- Sector Development. Of all the specific sector growth goals, the development of commercial fishing and the fish processing industry received the most emphasis. Increased light manufacturing and recreation/tourism were generally favored. Several communities (Seldovia, Homer, Seward) wished to discourage petrochemical, refining and heavy industrial development. However, the development of OCS support services with strong government control, was favored by most cities, and timber growth and agricultural development goals were favored in Seward, Seldovia, and Homer. The Borough favored oil or petrochemical developments as a means of obtaining the financing necessary for the development of renewable resources. These goals (slow growth, fast growth, growth based on renewable resources) are reflected in the alternative strategy designs.
- Transportation. With regard to transportation system goals, only the Borough government exhibited a strong goal for system planning and development, tied to economic expansion. Most coastal communities shared the goal of developing a deep-water port facility, and Seward emphasized airport improvements and a more efficient use of their rail link.

- Employment. Nearly all the communities wanted increased long-term and nonseasonal employment opportunities.
- General. A strengthened economy with increased employment and higher wages were common goals. Borough goals included assistance to communities in fiscal, promotional, and development planning; close association with private industry on resource development; and development of an improved business climate. Most of the communities had their own goals for developing potentials and for improving the local business climate.

#### Social Goals

Social goals included continuing population growth, infrastructure development, life-style maintenance, cultural opportunities, improving living standards, and lowering the cost-of-living.

- Population. Most communities favor population growth based on a gradual increase in long-term employment; Homer appeared to be split on growth vs. no growth (1975); and Seldovia was opposed to rapid population growth. On the other hand, a very rapid five- to eight-percent growth figure was mentioned. These rapid-growth, slow-growth, no-growth goals are reflected in the design of the alternative development strategies.
- Infrastructure Development. The Borough and most of the communities mentioned the goal of minimizing duplication of public services. Expansion of port and harbor facilities was a fairly common goal of all Borough communities, as was the improvement of community roads and services.
- Life-style. Maintenance of life-style and quality-of-life was a goal held important by Homer, Seward, and Seldovia.

Both Kenai and Soldotna emphasized employment opportunities and growth over quality-of-life considerations, and increased cultural opportunities were goals for the Borough and several of the communities.

- Standard of Living/Cost of Living. One of the general social goals is to increase the standard-of-living in the Borough while decreasing the cost-of-living.
- Environmental. The Borough, Homer and Seldovia held the goal of encouraging growth and development that minimizes environmental damage to renewable economic resources.

#### Goals for the Role of Government

Goals concerning the role of government were strongly stated and often contradictory. Generally they reflect the desire to maintain local autonomy while receiving financial assistance from higher levels of government.

- Duplication of services. Minimizing the duplication of public services and administrative functions is a commonly held goal.
- Assistance to communities. Borough policy is to provide planning, fiscal, and technical assistance to its communities. Communities for the most part accept this assistance, except where it is viewed as preempting local plans (Seward) or simply isn't needed (Homer). These conflicting goals were also determinants for the design of alternative development strategies.

## STRATEGY DESIGNS

The review of historic goals and summary of present goals and development options resulted in the following alternative development strategies.

First, the no-growth, minimum-organization and financing goals fit the current pattern of no involvement in economic development by the Borough. That is, the Borough would not assist development in any way, either through stimulating economic growth or by supporting it with the provision of port or harbor facilities. No change in the Borough's organization would be required under this strategy. This option represents the common "base" against which all growth strategies can be compared. (See the following description entitled "Business-as-Usual".)

Second, the strong growth goals (five- to eight-percent growth in employment per year), and Borough assistance to that growth, would require major changes in the Borough. That is, if these goals are to be addressed, the Borough would have to be involved in an active promotion of economic development, and in the supply of transportation and financial assistance to support that growth. This high level of growth, to the year 2000, would also require a combination of major new activities such as the Beluga coal, bottomfish, the Pacific Alaska LNG and petrochemical plants, tourism, etc. As a consequence of its support of these developments, the Borough would have to assume transportation powers (including ports), a major organizational change. To most efficiently support the various economic activities, these powers would have to be assumed in, or be cooperatively exercised with, cities throughout the Borough. This high level of growth could not be supported on a piecemeal

basis through the exercise of transportation powers solely in a service area or unincorporated areas of the Borough. This strategy is described below as the "Accelerated Growth Strategy".

Finally, an intermediate growth strategy is described below. Key aspects of this strategy would involve meeting goals of long-term growth goal based on renewable resources (fish, timber, tourism); a minimal assumption of port powers by the Borough in the unincorporated areas; and cooperative, city/private-sector/Borough efforts to maximize the capture of development benefits. This strategy is referred to as the "Sustained Development Strategy" throughout this report.

These strategies are described and compared in the remainder of this Appendix. Information and data for these descriptions are taken from the report chapters on Port and Harbor Demand Analyses, Site and Facility Requirements and from the Feasibility Analysis.

#### Business-as-Usual Strategy

Population and permanent employment growth rates of one- to two-percent per year are expected as a reflection of minimal efforts by the Borough to stimulate the economy. No significant OCS, coal, tourism or bottomfish development is expected to take place under this strategy.\* (The proposed LNG plant will require a large transient construction crew but a relatively small permanent operating workforce.) Continuing growth would take place primarily in the Kenai/Soldotna, Nikiski, and Homer areas.

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\*These population and employment growth rates correspond to the Level B, "Low Case Projections" of the Alaska Water Resources Study entitled "Southcentral Alaska's Economy and Population 1965-2025", Univ. of Alaska. 1979.

Port and harbor improvements would be oriented primarily toward meeting latent, recreational and commercial boat demands. Private-sector planning and investment activities would continue on a project-by-project basis such as for the proposed LNG construction dock--and federal/state financing would provide the basis for new harbor improvements. The Borough would not finance or participate in any port or harbor improvements.

Economic demands for port improvements would be minimal:

- Recreational boating demands would continue to grow with the supply of berths lagging demands and with some continuing recreation/commercial boat conflicts.
- Growing commercial fishing operations in the cities and in unincorporated areas would continue in crowded, sometimes unsafe conditions.
- Growing fish processing operations would continue in crowded private and public facilities. Most truck transportation costs would remain high and almost all wages and profits from trucking would accrue to employees and firms outside the Borough.

These activities and related port needs are summarized in Table A-1.

In conclusion:

- The Borough would not organize, plan for, or help finance any port improvements. Cities would continue to work with state and federal agencies to finance projects in their jurisdictions



Table A-1 BUSINESS-AS-USUAL STRATEGY

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● GENERAL PROJECTION		<u>1990</u>
	Population	28,000
	Employment	10,000
● PORT-RELATED ECONOMIC DEVELOPMENTS		
Primary Sector		
	Agriculture/Timber	No near-term expansion; periodic activities
	Mining	Oil/gas exploration in LCI
	Fish Harvesting	4.4 million salmon; halibut (4000 tons); bottomfish (15,000 tons)
Secondary Sector		
	Agriculture/Timber	No near-term expansion
	Processing	
	Minerals Processing	Pacific Alaska LNG
	Fish Processing	Salmon (20,000 tons); halibut (4000 tons); bottomfish (4,800 tons @ 32% yield)
Tertiary Sector		
	Recreation	Meet latent demand for about 1000 slips
	Tourism	Up 4 percent (slightly declining share of state growth)
	Transport System	No significant improvement
	Power, Water, Waste	Bradley Lake Dam
● PORT IMPROVEMENTS		
	Homer	Breakwater/dike; RO/RO berth; 350 recreational boat slips; 50 commercial boat slips (including charter)
	Kasilof	Some improvements by the state
	Kenai	Possible small boat harbor; 400 slips
	Nikiski	None
	Seldovia	100 commercial boat slips
	Seward	Breakwater; commercial pier; 400 recreational boat slips; possible city/private Fourth of July Creek Development
	Tyonek	None
	Ninilchik	None

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- The development of economic resources and the generation of related jobs or profits would be slow because few major developments would take place
- Goals of reducing transportation costs are not attainable under this strategy, and
- No Borough involvement in stimulating economic or transport development is one of the few goals that would be attained under this strategy.

#### Sustained Economic Development Strategy

Population and employment growth rates of two- to three-percent per year would be only slightly below the Level B "Intermediate Case Projections" of the Alaska Water Resources Study. This growth would be related to a significant bottomfish industry (harvesting, processing and marketing); a growing tourist (as opposed to recreation) industry; and possibly, the coal field and cement plant projects. It is important to note that these are developments in addition to those expected under the "Business-as-Usual" option.

Port and harbor projects would be more commercial than recreational in nature (general cargo, fish, coal, etc.). The emphasis would be to support renewable resource developments (fisheries and tourism) and, if necessary, to use oil/gas-related tax revenues to support this long-term sustained growth.

Cooperative Borough/private-sector planning and implementation would be the key to capturing the maximum benefits from the following projects: bottomfish, tourism, oil/gas, or coal. A vote would be necessary to permit the Borough to participate in port or harbor improvements. State and

federal funding levels would be higher than current levels because of the more unified, aggressive efforts to obtain them.

The Borough and cities will have choices under this option, one of which will be setting priorities for projects. From the standpoint of employment and financial benefits, the choices should be to support bottomfish, tourism, and general cargo needs. Coal and cement would be next, with the minimum-benefit recreational boating last. Oil and gas developments can be accommodated by the port improvements proposed for this strategy and related tax revenues could be used to support new, feasible projects. See Table A-2.

Conclusions for this strategy are:

- Borough assumption of port powers in the unincorporated areas is required to plan for, finance, and implement this strategy.
- Economic and related port projects would be undertaken on a staged, incremental basis. While the potential to expand is incorporated in the proposed facilities design, expansion will take place only as demand arises.
- A port authority, by itself, cannot accomplish the goals of this strategy. There must also be organized, cooperative efforts by the Borough Office of Economic Development, by the cities, and by the private-sector to promote basic economic growth.

#### Accelerated Growth Strategy

Population and employment growth rates of five- to six-percent per year would depend on significant oil and gas discoveries (Lower Cook Inlet, Upper Cook Inlet, Shelikof Straits or Gulf of Alaska) and on

Table A-2 SUSTAINED ECONOMIC DEVELOPMENT STRATEGY

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● GENERAL PROJECTION	1990
Population	32,000
Employment	13,000
● PORT-RELATED ECONOMIC DEVELOPMENTS ( <u>additive</u> to those under the Business-as-Usual Option)	
Primary Sector	
Agriculture/Timber	No major change
Mining	Limestone; coal; oil/gas exploration
Fish Harvesting	Bottomfish harvest (15,000 tons)
Secondary Sector	
Agriculture/Timber Processing	Possible new dimension mill
Minerals Processing	Possible cement plant
Fish Processing	Bottomfish (4,800 tons @ 32% yield)
Tertiary Sector	
Recreation	Accommodate growth (1100 slips)
Tourism	Up to 8 percent (keep present share of state growth) new hotels, restaurants
Transport System	Access to icefields; Seward airport ext.
Other	Skill center at Kenai or Homer
● PORT IMPROVEMENTS ( <u>additive</u> to those under the Business-as-Usual Option)	
Homer	350 recreational boat slips 200 commercial boat slips Commercial wharf and transit shed
Kasilof	Improved dock and boat storage plus boat lift
Kenai	No additional improvements
Nikiski	Breakwater; dock; RO/RO ramp
Seldovia	Charter and small cruise boat facilities 50 commercial boat spaces
Seward	600 recreational boat slips 40 commercial boat slips Boat ramp and parking Fisheries support pier
Ninilchik	Breakwater for a safe harbor
Port Graham	Fishing dock and 100 slips

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Borough efforts to stimulate growth in tourism, bottomfishing, and the petrochemical industry (using gas liquids from the North Slope). Adoption of this strategy would require a city and Borough commitment to take a highly competitive stance with regard to Kodiak, Anchorage, Whittier, and Valdez for OCS support, bottomfish and tourism developments.

Additional port and harbor improvements to support this growth would consist of port facilities to permit Homer to compete more effectively with Kodiak for fish, boat repair, and tourist activities, (see Table A-3). Also, if accelerated growth is desired, other requirements would become critical, and include small businesses to serve the oil/gas, tourist, fish or recreation industries; education/ training programs; and "created" attractions like convention centers or recreational theme parks.

This rapid growth will also require risk taking by the Borough and cities, since financial support might be provided to projects that never succeed. However, with the success of exploration efforts in the LCI, sufficient tax revenues could be available to support higher-risk projects or programs. Risks in this type of accelerated growth are increased by a lack of consensus for very strong growth, inadequate organization, staff or financing arrangements, etc.

Choices would also exist under this strategy. Because of the tax revenues required to accelerate economic growth, oil, gas and coal developments should be supported and accommodated. Tourism and bottomfish programs would be the next priority followed by recreational boating. Even with strong efforts to increase benefits from recreational boating, this development should be given the lowest priority.

Table A-3 ACCELERATED GROWTH STRATEGY

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● GENERAL PROJECTION		<u>1990</u>
Population		40,000
Employment		15,000
● PORT-RELATED ECONOMIC DEVELOPMENTS ( <u>additive</u> to those under the Sustained Development Option)		
Primary Sector		
Agriculture/Timber		Significant timber activity
Mining		Oil/gas and coal developments
Fish Harvesting		Bottomfish @ 30,000 tons
Secondary Sector		
Agriculture/Timber Processing		Dimension mill possibility
Minerals Processing		Possible oil/gas processing facilities
Fish Processing		Cold storage facilities, other small businesses, and market promotion activities; bottomfish processing of 9,600 tons @ 32% yield
Tertiary Sector		
Recreation		Add retail sales and supply businesses
Tourism		Up to 12 percent (an increasing share of state growth); new hotels/restaurants
Transport System		Local Kenai Fjord boat tours; exhibits.
Other		Add convention center, new skill center in Kenai or Homer
● PORT IMPROVEMENTS ( <u>additive</u> to those under the Sustained Development Option)		
Homer		Container crane and equipment Possible improvement for offshore support
Kasilof		No added improvements
Kenai		No added improvements
Nikiski		No added improvements
Seldovia		Possible improvements for offshore support
Seward		No added improvements
Ninilchik		No added improvements
Cape Starichkof		Oil/gas or product pier developments
Port Graham		No added improvements
Tyonek		No added improvements.

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#### Conclusions:

- The coordination necessary to achieve this growth would require a Boroughwide assumption or cooperative exercise of transportation powers to plan for, finance, and implement projects.
- Full development of potential resources and opportunities would take place in the shortest possible time under this option.
- A well financed and organized effort by the Office of Economic Development would be required to promote and attract tourism, or to stimulate fish and general cargo activities.
- The successful implementation of this strategy would involve high risks because of the: 1) major organization and staffing requirements; 2) needs for a very strong Boroughwide consensus on promoting rapid growth and; 3) the highly speculative nature of some of the developments required under this strategy.

#### STRATEGY COMPARISONS

The basis for comparing the three growth options is first, the extent to which the adoption of a particular strategy will help meet Borough and city goals, and second, the extent to which that option will place organizational or financing requirements on the Borough. Thus, Table A-4 includes an assessment of economic attractiveness, financing and organizational requirements. As a reflection of the importance and possible complexity of organizational and financial arrangements, the comparison also includes an assessment of risks for implementing each strategy.

Table A-4. STRATEGY COMPARISONS

Strategies	Economic Attractiveness	Financial Requirements	Organizational Requirements	Risk of Failure
Business-as-Usual (No Borough involvement in port projects)	Borough benefits (wages and profits) exceed costs for supporting this low level of growth. However, permanent, non-seasonal employment grows at a rate of 1 to 2 percent a year since new business opportunities takes place slowly.	Borough financing of port or harbor improvements is not possible without an assumption of port power. This lack of Borough support delays or hinders private sector activities that require port improvements outside cities.	None	Low
Sustained Development (Median level of Borough involvement in port projects)	Benefits (wages and profits) exceed costs to the Borough for (1) promoting economic development and (2) financing port and other transport improvements. New business and economic opportunities not only require new education/training programs but also a well designed financing program. A 3 percent growth rate would result.	The Borough would become involved (with the state and federal agencies) in financing or supporting growth to the extent that tax revenues permit. Long-term borrowing would be minimized due to a desire to finance development on a pay-as-you-go basis. This funding would permit the support of selected projects rather than of broad programs for economic development growth.	Borough assumption of non-area-wide port powers (excluding Cities) plus organization and financing of promotional activities and cooperative development with city and private-sector developers.	Medium
Accelerated Growth (Major Borough involvement in economic and port development)	Costs would significantly exceed benefits over the near-term as a result of the Borough's highly competitive growth stance. However, jobs, wages and new business would grow rapidly. Subsidies would be required in the form of low taxes and user fees over the near term. A 5 to 6 percent growth rate would be attained.	New oil/gas tax base revenues and long-term borrowing would be required to support this strategy. Cities would also be required to participate in financing development programs under this strategy to the extent that needed transportation improvements fall within their jurisdiction. State and federal assistance would be imperative.	Borough assumption of area-wide power (including cities) plus organizing coordinated city-private sector efforts to promote, finance and implement economic development and port and harbor improvements.	High



The criteria for economic attractiveness are:

- the balance of benefits (profits and wages) over costs (port improvements, access roads, water supplies, etc.)
- increased job opportunities, employment and population, and
- the extent to which a strategy would stimulate the development of economic resources of the Borough.

From organizational standpoint, an alternative that requires special attention is that of the service area, a concept currently under consideration for the Kenai-Nikiski area. On a preliminary basis, this alternative appears to be the least attractive organizational option for the following reason.

Financial resources for port development are one of the most important aspects of the Sustained Economic Development and Accelerated Growth strategies. Thus, any diversion of financing resources (to a service area) cannot help but weaken and diminish near-term, Borough-wide development efforts. Given the moderate growth potential and related port-harbor financing requirements in the Kenai-Nikiski area, the service area approach would: 1) provide more funding than needed in the area, and 2) seriously limit the availability of funds for developments in other areas. Thus, the creation of a limited, service-area organization can have the effect of severely limiting the Borough in the attainment of its growth goals.

APPENDIX B  
TOURISM DEVELOPMENT STRATEGY

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If the Borough wishes to focus on sustained or accelerated economic development, a significant growth in tourism, as opposed to recreational boating, will be required. As indicated in the body of this report, the provision of boating slips and ramps alone accomplishes little in the way of economic development, either through employment generation or through expanding opportunities for private sector investments in hotels, restaurants, equipment sales, etc. Thus, the current focus in the Borough should be redirected--away from ordinary recreational boating--toward increased tourism activities.

The most important difference between recreation and tourism is that tourism emphasizes attracting people to Kenai Peninsula for those kinds of activities that generate significant amounts of employment and income. Thus, a tourism strategy would emphasize developments to serve those people interested in using lodge, hotel, or motel accommodations and in patronizing local restaurants, shops, and cultural facilities and events. Furthermore, a tourism development strategy, as opposed to boating development, would emphasize different kinds of activities, different markets, and different resources.

The design of a comprehensive tourism development strategy is far beyond the scope of this study. Nevertheless, it is possible to outline some of the main factors that should be considered in such a strategy.

Markets. The Kenai Peninsula is a potential destination area for several tourism market segments. As indicated previously, approximately 240,000 persons visited Alaska during the summer of 1977, primarily for pleasure purposes. This market has been growing at the very high rate of approximately 16 percent annually since 1964. Even if this high growth rate cannot be sustained, the growth outlook for tourism to the state appears excellent over the next decade.

The fastest growing tourism segment is composed of those people who travel to Alaska by air. This group could be a high-priority tourist market for the Kenai Peninsula, particularly since overland visitors to Alaska have represented a declining share of the total tourist volume for several years. In view of increasing gasoline costs, this segment may be expected to continue to decline as a share of total tourists, and perhaps even to decline in absolute numbers. The number of visitors to Alaska on cruise boats has also increased rather dramatically over the last 10 years. However, limitations on total worldwide cruise boat capacity will serve to limit the future rate of growth in this market at least over the next few years. Even though the air segment appears to be the most promising, a comprehensive tourism development strategy should include elements directed to all three of these major market segments.

Similarly, separate strategies should be developed and directed to the independent-traveler and package-tour-traveler segments of the total market. The independent-traveler segment currently accounts for about 70 percent of the total. However, there are national indications that package-tour travel will be increasing as a percent of total travel over the next decade.

A part of the tourism development strategy should be directed to in-state residents. Anchorage is the obvious primary target, in view

of its size and proximity, but smaller tourist increments might also be attracted from the Fairbanks or Panhandle regions.

Finally, successful tourism development usually also entails attracting convention markets. Most tourism is highly seasonal, especially in Alaska, and most tourist destination areas make major efforts to support their accommodations and food service establishments in the off-season by meetings and conventions. The Kenai Peninsula Convention Bureau already has an active program to attract meetings and conventions, and this program would have to be expanded to keep pace with any expanded tourism development effort.

Resources. The Kenai Peninsula has a wide spectrum of resources that could serve as a basis for attracting tourists. However, many of these resources appear to be underdeveloped:

- Virtually the entire peninsula has outstanding natural resources. Chief among these are the Kenai Fjords National Park, the inland lakes and rivers, other coastal areas, and ice fields and glaciers. In fact, the Peninsula offers in a local setting most of the kinds of natural resources found throughout the entire state; it has been called, "Alaska in miniature."
- Historically, superb fishing has been the Kenai's main tourist resource, and it will undoubtedly remain important for the foreseeable future. It is possible, however, that the Kenai Peninsula communities--and private tourist facility operators--have overemphasized fishing, to the exclusion of other very significant resource opportunities. For example, considerably more use could be made of the Kenai's resources for river rafting, hiking, and trekking. Also, several areas

(especially those on the west coast that enjoy relatively mild weather) could be very attractive sites for such participant recreation activities as golf and tennis, in connection with other tourist developments.

- Apparently, there has been very little focus on development of the Kenai Peninsula's cultural resources. According to some sources, the Russian history and culture could be as significant to the KPB as they are to Sitka, although virtually nothing has been done to date to emphasize this resource. Similarly, many other parts of Alaska have capitalized much more heavily on Native American culture than has the KPB.
- Several Peninsula communities could easily be developed along certain key tourist-oriented themes. For example, Homer could become a seafaring and art colony, while Ninilchik and Seldovia could emphasize fishing and boating. Several of these areas could be developed as outdoor-oriented resort complexes. As part of any such development, some attention would also have to be directed to a Boroughwide, community improvement program.

Accommodations. The Peninsula, with the possible exception of Homer, presently has few tourist accommodations. Clearly, major growth in tourism would require significantly increased hotel accommodations, restaurants, and other kinds of facilities that serve tourists. For example, new accommodations would be needed in developing the Kenai Fjords National Park.

Many tourist areas have found that meeting and convention centers are a particularly attractive adjunct to accommodations as a way of attracting off-season visitation. Kenai may not compete well with Anchorage for major conventions, but there is a very large market for

smaller convention and meeting programs for which the KPB might compete strongly.

Transportation. Major growth in tourism to the Kenai Peninsula will require an improved transportation system. Improvements should include both improved air service and improved low-cost bus service from Anchorage. But transportation, by itself, will not attract tourist markets: improved transportation can only facilitate--not create--tourism demand. This will be true of the direct, Seattle-Kenai air service which is provided only on a seasonal basis.

Tourism Benefits. Conventional wisdom holds that most employment generated in the hospitality industry is of low "quality" because of relatively low wage rates and high seasonality. However, the state tourism office has developed some figures that refute this generally held view. Whereas 50 percent of Alaska's hospitality industry employment is, in fact, involved in low-pay, low-skill jobs, the other 50 percent is composed of self-employed entrepreneurs who enjoy relatively high standards of income. Thus, the total economic development impact of increasing tourism in the Kenai Peninsula could be significant.

With the organization of an aggressive tourism development program, it is anticipated that the Kenai Peninsula Borough would be able to increase its share of the state's tourism market. That is, the Borough would expect an eight percent per year growth or up to 40,000 additional visitor days by 1990.

Preliminary Tourism Development Recommendations. As one of the nation's--indeed, the world's--great fishing spots, the Kenai Peninsula should obviously concentrate a significant portion of its efforts on capturing an increasing share of the fishing market. In general, it appears that both governmental agencies and private tourist facility

operators are aware of what has to be done to attract and accommodate people who want to enjoy the area's outstanding fishing.

The fishing market, however, is limited, and fishing is growing relatively slowly as a tourist activity. There are also indications that people on fishing vacations spend less in the local economy than other types of vacationers. Accordingly, the Kenai Peninsula will have to look beyond fishing markets if it wishes to increase its share of state tourism.

Although exact determination of future requirements must be based on far more extensive study than was possible in this ports and harbors project, the following areas appear to be most promising:

- A market should exist for some first-class tourist accommodations with extensive recreation facilities. Some of these could be geared to local resources, such as boating, hiking, fishing, and the like. Swimming pools, tennis courts, and even a golf course in Homer might be desirable.
- Opportunities for local, small-scale boat cruises from Seward to Prince William Sound and the Kenai Fjords are possible.
- Emphasis should be placed on development and expansion of local fairs, festivals, pageants and the like. Inspiration may be drawn from Native American culture, the Russian heritage, the fine arts, the performing arts, and other appropriate sources in Port Graham, Seldoviz or Homer.
- Commercial development of the major KPB cities will be required. One outstanding example, for example, is the gradual transformation of the aging downtown Ashland, Oregon into a

dynamic tourist-oriented "Elizabethan" village, as a complement to their very successful Shakespeare festival.

- Marketing efforts must be directed toward independent travelers, who form the backbone of Alaskan tourism. However, increased attention should also be given to working with the larger package-tour operators, who are capturing an increasing share of the domestic tourism market.

These activities--and many others--will help attract more visitors to Kenai, and especially those visitors who will: 1) stay longer than current visitors, and 2) spend money for local goods and services.

There are indications that some KPB residents are emphasizing port and harbor developments as a major element in future tourism. In many ways, such an emphasis is misdirected. It is highly unlikely that more large cruise ships will visit the Peninsula, no matter how much money is spent on port improvements. Except for an outstanding opportunity to develop an entirely new local cruise market--which, incidentally, would not require significant port improvements--the major elements of a future tourism strategy do not appear to be strongly port-related.



